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A

TREATISE

ON THE

COMPARATIVE GEOGRAPHY

OF

WESTERN ASIA,

ACCOMPANIED WITH AN ATLAS OF MAPS.

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BY THE LATE

MAJOR JAMES RENNELL,

FELLOW OF THE ROYAL SOCIETIES OF LONDON AND EDINBURGH; MEMBER OF THE ROYAL INSTITUTE OF PARIS, AND OF THE IMPERIAL ACADEMY OF ST. PETERSBURGH; AND FELLOW OF THE ROYAL SOCIETY OF GOTTENGEN.

IN TWO VOLUMES,

WITH A COMPLETE INDEX.

VOL. I.

LONDON:

PRINTED FOR C. J. G. & F. RIVINGTON,

ST. PAUL'S-CHURCH-YARD,

AND WATERLOO-PLACE, PALL-MALL.

1831.

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TO THE

KING'S

MOST EXCELLENT MAJESTY.

SIRE,

WHEN I presumed to solicit the honour of dedicating a work to your Majesty, commenced under the auspices of your royal father, I considered that I was fulfilling a duty to departed worth, by placing under your Majesty's high protection the labours of a revered parent; and the gracious manner in which your Majesty was pleased to grant my request will ever be a source of pride and gratification. The lamented Author has left on record, that it is to the munificence of your Majesty's royal father, and to his zeal for the improvement of science, that the Public are indebted for the appearance of this work.

If I could consider myself capable of doing honour to the dignity of the subject, I should expatiate on the many admirable qualities of your Majesty's august father, whose virtues shed a lustre round the throne which will be duly appreciated by posterity, the only true criterion of merit.

That your Majesty's valuable life may long be preserved to reign over a grateful people, is the fervent wish of,

SIRE,

Your Majesty's most dutiful subject,

JANE RODD.

Wimpole Street,
July 15, 1831.

PREFACE OF THE EDITOR.

THE interesting subject of the present Work, and the Author's name, will, I trust, ensure it a favourable reception from an indulgent Public, who will make allowances for such imperfections, as, under existing circumstances, are perhaps unavoidable. My grateful recollection of the manner in which my late father's former publications have been received, makes me the more solicitous for the fate of the present volumes, as his posthumous fame has been committed to my care, and I feel the high responsibility of my situation. Some of the Maps are unfinished, owing to the declining state of my father's health, which rendered him unequal to any great personal exertion, during several years before his death; this will account for the deficiency of some recent geographical information, as with the approbation of my father's scientific friends, I have determined to submit the Maps to the Public exactly as he left them, in preference to making any attempt to complete them by another hand. In like manner the Author's Preface, although referring to a more extensive

work, is printed exactly in the state in which he left it. Compared with the Maps, it will perfectly explain my father's original plan, and may perhaps induce some other geographer to pursue that design. The manuscript of the present publication was in a very perfect state, but whenever any little difficulty occurred, I have always consulted Lieutenant-Colonel Leake, late of the Royal Artillery, and I am happy to have this opportunity of expressing my obligations to him for his kind and able assistance during the progress of the Work through the press.

JANE RODD.

Wimpole Street,
July 15, 1831.

PREFACE OF THE AUTHOR.

AMONGST the regions of Asia that are more particularly the subject of public attention and enquiry, there are none whose geography is in so imperfect a state as those situated between India and Europe. And the difficulty is felt still more in the study of ancient history, than in the references to modern geography; insomuch that the particulars of ancient military history are usually taken for granted, through the deficiency of means for verifying them; a means that would add to the value of history, by inspiring a confidence in the facts related. It may be added, that this tract contains almost the entire scene of ancient military history in ASIA. And as a combination of military movements cannot well be understood without a reference to tabular geography, the Author has attempted a work, founded chiefly on new authorities, and calculated not only to explain the movements in question, but containing, on the same ground, both the ancient and

modern geography; so that a comparison may be made between them on a mere inspection.

If it should be asked, what are the pretensions to superior merit in this work, to that of M. D'Anville's, on ancient geography? it is to be answered, that they are works of a totally different kind. M. D'Anville's, as the title imports, is "*An Abridgment of Ancient Geography;*" and considered under that title is, perhaps, not to be excelled, in any age or country, in respect of its plan and general execution; but as geography is progressive, and much more is known now than at the period when he wrote, there are necessarily in it many errors and deficiencies, which are obvious to people of the present time, and may easily be corrected or supplied, without any injury to the plan of that admirable work.

But the present work contains the *detail* of a large portion of the *general* subject of M. D'Anville's. And the author is so far from wishing to place that of M. D'Anville in the *back ground,* or to decry its value, that he humbly considers his own work as a supplement to, or comment on, the other, and earnestly recommends the study of M. D'Anville's, in order to facilitate that of his own. For the work of M. D'Anville will mark the great outlines and principal divisions of our subject; at the

same time that the reader will be instructed in the general scope of ancient geography, and be better qualified to appreciate the value of the present work.

The grand divisions of M. D'Anville's work, here attempted to be illustrated in detail, are the first, second, third, fifth, sixth, and seventh; that is, six of the nine divisions of Asia: containing *Asia Minor* at large; *Armenia,* and the countries between it and *Caucasus; Syria* and *Mesopotamia; Media, Assyria,* and *Babylonia; Persia* and *Susiana;* with *Carmania* and *Gedrosia;* and, finally, *Aria, Bactriana,* and *Sogdiana.* In effect, the western, or *hither* Asia, being the tract generally between India and Europe, on the east and west; Arabia, with the head of its gulf and the Indian Sea, to the south; Russia and Tartary to the north. And its area, although it be so small a proportion of Asia, taken at large, is yet equal to *more than three-fifths* of that of Europe.

It has ever appeared to the Author, that the study of ancient history has been retarded through the want of a Tabular System of geography, properly adapted to it. It can hardly be doubted, that, in the ordinary mode of comparing the ancient and modern together, by the means of separate maps, so great an

effect is not produced on the mind, as when both subjects are combined in one, mutually illustrating each other. For surely when the two names, ancient and modern, stand side by side, they ought to convey a more accurate idea to the mind, than if referred to each other from separate maps; not to mention that the eye cannot so accurately measure the space, as to be *certain* whether the two names belong to the same point or otherwise.

In like manner, the names of the great divisions of territory, ancient and modern, placed in the same map, exhibit a comparison of their respective boundaries, more perfectly than when expressed on two maps.

There is, no doubt, some hazard of confusion in the execution, but this may be prevented by the use of a sufficiently ample scale, and a difference in the writing and symbols. It is true that, in this matter, the Author differs from M. D'Anville, but as the observation occurs in his Preface to the Abridgment, it is possible that the idea applied only to an *abridged* geography; in which case, we agree with him, for small maps of the kind alluded to would produce nothing but confusion.

With respect to the work before us, it is certain

that a single map, large enough to contain the whole, would have been too unmanageable for ordinary use. For although any number of sheets may be referred to in an atlas, for the purposes of ancient history; yet as modern geography is equally an object of the design, they would not suit that purpose, for the generality of persons, who would probably wish to have them joined. And a map contained in six of the largest sheets in common use, when joined, appears to be sufficiently large for the convenience of people in general.

This being the case, it was judged proper to divide the space into two parts; the one to the west of the Caspian Sea; the other to the east; so as to repeat that entire sea in both, and also to include the whole of the Persian Gulf, in the eastern part; whilst the head of it, as well as the country as far as *Persepolis* and the eastern border of *Media* (or Persian Irak), should be included in the western part. By this management, the connection between the two will be rather interrupted than broken.

It has also been judged prudent, in a work of so great an extent, and embracing so many objects, to execute one part only at a time, and the western, as more laborious and important part, the first; laborious, as being formed from so vastly greater a

mass of materials than the other; and important, from its containing the principal scenes of ancient military history; for beyond *Persepolis* and the Caspian Sea, the field has been little occupied, save by Alexander. Whereas the other contains the *principal* warfare of Alexander; the retreat of the Ten Thousand; the expeditions of Cyrus, Xerxes, Pompey, Antony, Crassus, Trajan, &c. &c.

To *this first* part of the Comparative Geography of Western Asia, then, the matter which follows is intended alone to apply. And even this tract has an extent, from west to east, of more than 1600 British miles, from the *Oasis* of *Ammon* (Siwah), in *Libya*, to the site of *Persepolis*, in Persia; and, from north to south, 1350 such miles, from Zaritzin, on the Wolga, to the borders of Upper Egypt and the head of the Persian Gulf. So that, including the Euxine, Caspian, and eastern bason of the Mediterranean, the *space* is considerably more than one-third of Europe.

It has been the earnest endeavour of the Author to render the execution as distinct as possible; by choosing, in the first place, a scale of competent extent, (three inches to a degree); and by a due regard to preserving, as far as possible, a *contrast* between the two departments of ancient and modern

geography. The natural, or absolute geography, applies, of course, to either indifferently; save only where alluvions have extended the coasts, or joined islands to it; or formed the head of a deep gulf into a lake, as at *Miletus*. The names of the modern grand divisions of territory are written in a *strong* character, as *coming forward;* whilst those of the ancient are in *hollow* characters; throwing the ancient divisions into the *back ground;* so that the modern, as it were, shews itself; but the ancient must be sought out. This is the grand distinction; but the ancient names that are too small to be made hollow, are universally *underlined.*

Cities and towns are expressed by different symbols, which point out whether it was an ancient city only, and never revived in modern times; whether, on the contrary, entirely modern; or whether it has existed as a city or town at all times.

A variety of lines, or combinations of lines, distinguish the roads; whether ancient Roman roads, or modern roads; and also the cases in which the two coincide, as often happens. The routes of Xenophon, Alexander, Julian, &c. have also distinguishing lines; together with the *direction* in which they respectively moved.

The Roman roads in Asia Minor form a curious and useful addition to this geography. Every such road that could be transferred from the different Itineraries, &c. to the tabular geography, has been attempted; and, it is hoped, with general success. In many instances, however, the numbers of miles are wanting, although the direction of the road cannot be mistaken. The *numbers*, however, are inserted only in the Maps of Construction, to prevent crowding and consequent confusion.

As the scale allows sufficient room, it was thought best to draw the hills in the mode commonly called *bird's-eye*, in preference to the *hay-cock* form, in ordinary use; and which the want of room, in smaller scales, renders necessary. The evil attending this mode is, that they often *hide* the position of a place that lies beyond them; and, in consequence, either the hill or the object must be falsely placed.

Not that even our scale admits of expressing the *detail* of the hills in such a manner as could be wished; but it, at least, gets rid of the objection above stated. It also preserves some kind of proportion in the breadth of the ranges; and fully expresses the general bearing and limits of their bases, in which the other totally fails.

Since the illustration of ancient military history is a principal object of the work; and more particularly that of Xenophon and Alexander; it was found, that although the general scale sufficed for expressing their ordinary lines of march; yet that certain particular transactions required more room to express them. Such is the warfare of Alexander and Darius in the Strait of *Issus*; which required a clear delineation of the different passes of *Cilicia* and *Syria;* and, of course, a separate plan, on a much enlarged scale. This includes also the marches of the younger Cyrus with Xenophon; and the campaign of Cicero, in *Amanus*, &c.

The same may be said concerning the warfare of Alexander and Darius, near *Arbela.* Also, of the marches of Cyrus the younger, through Babylonia to the field of *Cunaxa.* And of the early part of the retreat of the Ten Thousand, whilst pursued by the Persian army; and until they ascended the Carduchian Mountains. It happening that the scene of the warfare of Julian was over much of the same ground with the latter, it was convenient to insert it without having recourse to another plate. And, moreover, a small extension of it includes also the canals, generally, leading from the Euphrates to the Tigris; together with the environs of ancient Baby-

lon and Seleucia; the *Pallacopa;* and some other subjects of ancient history.

A most important part of the tabular geography remains to be mentioned; namely, the record of the Construction of the Comparative Geography. This is contained in four large Maps; the first being a general view of the whole *data;* the other three, the detail of such parts of the other as required amplification. This construction is explained by about 330 pages of letter-press; and the whole was deemed essential, as involving the foundation and construction of future, and more improved, systems of geography of the same tracts. For after so much labour and time had been employed in collecting the authorities, their use would have been lost to future geographers, had they only remained in the mixed state, in which they must necessarily exist in a map.

It is, however, obvious that the generality of readers have no concern with geographical discussions; and had it been possible to have rendered perfect, at once, the geography of the countries in question, it would have been unnecessary to say *how* it was accomplished, however laborious and intricate the operation. But geographical improvements being progressive; and after all our labours, the

work remaining in an imperfect state; it was proper that the history of the progress should be set forth, in order that future geographers, who might be possessed of new materials, might be aware of the value of the old; and thence learn what parts might be assimilated, what rejected. It is probable that such opportunities will soon occur from the enterprising spirit of the present age; perhaps of all others, the most favourable to geography. Indeed the principal use of this part of the work after merely satisfying the curiosity of the scientific reader, is to convey to those who come after, a distinct knowledge of the nature of the materials, which furnished the ground-work of this geography, in their original state; so that, on occasion of a reconstruction of it, when a fresh stock of materials shall be collected, such of the present ones as may be wanted may be again brought into use. But had they been only blended together in a map, without any discrimination, their use would either have been lost, or they must *again* be sought out; after the incredible labour and length of time that has already been employed in collecting them.

Throughout the discussion of the mode of construction, the reader will recollect that the object is to obtain *general,* not *accurate* results; the materials not admitting of nice coincidences. General accuracy

alone is therefore studied; so that in the relative positions of distant places, a difference of a few miles only, between the results, from different authorities, will not be regarded so much a discordance as a kind of virtual coincidence. The geography of empires, in which geodesian operations have scarcely ever been attempted; and in which the celestial observations are scanty, and in many cases erroneously stated, by copyists and translators, must, if at all, be accomplished by a sedulous attention to every notice that can aid the purposes of geography, in whatsoever shape it may present itself; not only in a geographical, or historical, but even in a poetical form. It must, therefore, follow, that such notices must sometimes be fallacious; often imperfect. It also happens that a few positions depend on a kind of *constructive* evidence, and can only be developed by a combination of circumstances. It must, however, be allowed, on the whole, that very great discords amongst the authorities are by no means common.

Having said thus much respecting the Maps, and their construction, it will now be proper to speak of the matter, which they are chiefly intended to illustrate, independent of their use in modern geography.

This FIRST PART of the comparative geography is

meant to be accompanied by three quarto volumes, divided into fifteen books, or grand divisions, explanatory of, or referring to, the maps contained in the atlas. Of these volumes, one alone is published at present, and is meant as a specimen of the work at large. It is the Author's intention, should it meet the public approbation, to publish the other two in succession; but should the matter generally be deemed too unimportant to meet the public eye, he intends, in that case, to select certain subjects from the body of the MSS.; such as the expedition of Cyrus, and retreat of the Ten Thousand; the warfare of Alexander and Darius, at Arbela; the expeditions of Julian, Antony, &c. &c., sufficient to form a middle-sized volume.

The present publication contains five of the beforementioned fifteen books. The other ten books are: 1. Armenia and the Caucasian countries; 2. Syria; 3. Mesopotamia; 4. Babylonia; 5. Susiana; 6. Assyria; 7. Media; 8. The Caspian Sea, &c.; 9. The Expedition of Cyrus, and Retreat of the Ten Thousand; and 10. The Arabian Desert. Of the preceding five, the first book contains the elementary part, or detail of the construction of the first part of the Comparative Geography. The second contains the Geography of Asia Minor, at large, each province separately considered, and the tracing of the Roman roads

within it. The third book relates to the Troad alone. The fourth is an examination of Arrian's Periplus of the Euxine Sea, with observations of various kinds respecting the coasts of that sea, and the knowledge of the ancients respecting their geography. And the fifth the course of *Mount Taurus* through Asia Minor; the passes of *Cilicia* and Syria through *Taurus* and *Amanus;* and the warfare of Alexander and Darius in the Strait of *Issus*. And these memoirs, or disquisitions, are accompanied with explanatory maps, in great detail [1].

It appeared advisable to divide the matter of the volumes into grand divisions, or BOOKS; each containing a subject, either distinct in its nature, or in its geographical position. These are divided into a convenient number of chapters, and these again subdivided into sections; by which arrangement it has been endeavoured to keep separate such particulars as, had they been thrown together in a mass, would have rendered each subject less perspicuous. In effect, most of these subjects required a separate

[1] The present work contains the first, second, and fourth of these five books. The second was divided by the Author into two, after his publication, in 1814, of the *Troad*, and, in 1816, of the *Expedition of Cyrus;* in which latter was comprehended also the greater part of the fifth book, or that relating to Mount Taurus, and the Passes of Cilicia.—*Ed.*

and particular discussion, either from the intricacy of the subjects themselves, or from perpetual recurrence to ancient history, for comparisons and explanations; and in some cases, from the requisite length and minuteness of the details. In some instances, however, the chapters are little more than subdivisions of the same matter, used as points of rest, to relieve the fatigue or attention of the reader as he travels forward.

It is proper to observe, that in these memoirs the Author professes to confine his observations to such particulars as may either be new to the public or imperfectly treated of by others; without pretending to offer a complete and systematic work, as if meaning to supersede all the works of others on the same subjects. On the contrary, he has, on proper occasions, referred the reader for further information to the works of those who have furnished useful details of the several subjects, and which are already before the public; but which, by the accession of new information, may be rendered yet clearer, and more easy to the comprehension.

The Dissertation on the TROAD was undertaken merely because the public appeared to have been misled by a very faulty topography of the ground as exhibited in M. Chevalier's Memoir of 179

The design was, to bring back the public opinion to the general state in which it was previous to that publication; or rather, to *restore* the system of the ancient authors, with the additional lights afforded by Mr. Gell and other late travellers.

The subject of the passes and movements of Alexander and Darius, in the Strait of Issus, &c. although so clearly (though too briefly) set forth by Arrian, has been rendered obscure and almost unintelligible by the geography of M. D'Anville, who has placed the field of *Issus* to the WEST of that city instead of the SOUTH; and the army of Alexander on the *Cilician* instead of the *Syrian* side of the river *Pinarus*. All which is quite contrary to history; by which we are repeatedly told, in the description of the order of battle, that the right wing of the Macedonians was at the foot of Mount *Amanus*, and the left at the sea-shore: and again, that the left wing of the Persians was in a hollow, or bay, of the mountains, and their right at the sea.

But the local information, respecting the ground of the Straits, &c. communicated by Messrs. Niebuhr, Pococke, and Drummond; and which altogether places the history of the above warfare in a clear point of view, is alone worthy of discussion, had M. D'Anville's representation been more exact.

The unavoidable delay in executing a work of such an extent, in all its parts, has given time for the arrival of new matter from the side of Persia and Armenia, communicated by Mr. James Morier. But it came too late to be inserted; as it affects in degrees, the whole line of communication between Kaswin and Amasia. It was supposed, that the best mode of applying the new materials was to construct that part anew, on an additional sheet, marking on the original map the limits of the tract, corrected; and, accordingly, the line of country between Kaswin and Amasia, on the east and west; Erzerum, Irwân, and Ardebil, on the north; and Erzingan, Wan, and Ormiah on the south, forms the subject of the additional map. The course of the Morad, or Eastern Euphrates, having been originally right in the line of Xenophon's retreat, his route is not affected. Another additional plate has also been added to the geographical construction.

It is to His Majesty's munificence, and his zeal for the improvement of science, that the public stand indebted for the appearance of this work; since the expense attending the execution of so extensive a plan does not exactly square with the means of a person of ordinary income. It was, therefore, on the representation of Lord Grenville (proofs of whose attachment to learning and science are on record)

that His Majesty was induced to direct a sum to be advanced in aid of the publication. And his lordship particularly encouraged the bringing forward of the detail of the construction; a part which, although it will be the least regarded, cost the Author more time and labour than the execution of the geography itself[1].

In justice to a highly respectable individual, the Author cannot suppress an offer that was made to him, at a moment when it appeared to the gentleman in question to be a matter of doubt, whether any other aid might have been obtained: and this offer was nothing less than the whole sum required for the execution of the work, *unconditionally*. This individual was John Walker, Esq. of Bedford Square.

[1] Mr. Smeaton assured the Author that his account of the operation of building the Eddystone Lighthouse, and of the mode of preparing the materials, &c. cost him more thought, labour, and time, than the erection of the edifice itself. But he might be said to have been not so much describing his own work as laying the foundations of future works. His time, therefore, could not have been better employed.

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BOOK I.

GEOGRAPHICAL CONSTRUCTION.

INTRODUCTION.

In respect of the following discussions, it is proper to observe, that being confined to mere geographical positions and lines of distance, no references are made, either to natural or political divisions of country; since they must be useless, where a *proper distribution of space* alone is attempted. For the present enquiry must be understood to relate alone to the authorities, on which the geography is founded, and the mode of combining them; so as to form what may properly be termed the skeleton, or frame-work of the geographical chart. The comparison of the ancient with the modern geography, as well as remarks on the geography itself, will be the subject of future discussions.

The extent of the tract through which this enquiry is pursued, respecting the distribution of the space within it, is no less than 28 degrees of longitude from west to east; that is, from the western shores of Asia Minor to the eastern extremity of the Caspian Sea. And in point of latitude, it is nearly 15 degrees; or from the eastern head of the Red Sea, and the port of Shiraz; to Mozdok, on the Russian

frontier. The general extent and scale depend on a considerable number of positions, whose latitudes and longitudes have been determined by celestial observations, taken by Europeans. Besides these, a great number of places have their latitudes alone determined in the same manner; and which have very materially aided the construction.

The reader will perceive that the intermediate positions are established generally by *lines of distance*, which are corrected in their length and direction, either by bearings, latitudes, or *cross-lines* of distance. One of these lines extends from Hillah, on the Euphrates, to the neighbourhood of Brusa, nearly two-thirds of the entire length of the space under consideration. This is the work of M. Niebuhr, to whom science is so greatly indebted. Other lines, in different directions, across Asia Minor, were drawn by Mr. Browne. And it is in a great measure owing to *these* two sets of lines, and to the trace of the southern shore of the Euxine, by M. de Beauchamp, that the face of Asia Minor assumes its present appearance in the Map. Of a vast number of other lines, of various degrees of value and importance, some serve for the foundation; others for the superstructure of the construction generally; but the materials are no where so perfect, or in so great a variety, as in Asia Minor. And, in consequence, that portion of the space has been constructed separately, (as well as conjointly with the rest,) on double the scale of the general map of positions.

The Oriental astronomers and geographers have

furnished great supplies towards the formation of the work, in Itinerary distances, latitudes, and longitudes; which, though often corrupted, still afford a great body of information; and that in cases where information could not be obtained in any other shape [1].

From all these sources, collectively, the body of geographical materials, that has been collected for the subject before the reader, is so great, that, together with the unconnected state in which the materials are often found in their original form; and the occasional contradictions and absurd results that sometimes occur, (owing probably to errors of copyists or translators), and which have given rise to many tedious discussions; from all these causes together, the work has been swelled to a size that may appear unreasonable to the generality of readers. Such being unavoidably the nature of the case, all that the

[1] As the authority of Ibrahim Effendi will often be quoted, it is proper to inform the reader, that he was an Hungarian renegado, who introduced printing and copper-plate engraving at Constantinople, in 1729. Sir J. Porter, who gives this account in the Philosophical Transactions for 1755, says, that he made only three or four maps; and he enumerates three—Persia, the Bosphorus, and the Euxine. The author has seen three; that is, 1, Iran, or Persia; 2, the northern part of Turkey in Europe and the Euxine; and 3, the Euxine as a sea chart. Of these he is in possession of the two first. It is possible, that by the *Bosphorus*, Sir J. Porter means the second of the last series; which contains the Bosphorus. There is in the library of the Royal Society a volume printed by Ibrahim. The author of this work stands indebted to Ibrahim's maps for a variety of information.

author could do, for the relief and accommodation of the reader, was to separate, as far as could be done, the different objects of investigation from each other, to avoid confusion and perplexity.

In the adjustment of the positions, the different authorities will be stated, and where a choice offers, that one will be adopted, which appears to be of the greatest weight, or to be least liable to exception. This part of the work requires, perhaps, more attention on the part of the reader, than can be expected from those who are not interested in the geometrical accuracy of it.

Notwithstanding the presumed authority of the observations of longitude, which have been adopted in this construction, most of which have a distinguished place in the registers of European academies; yet it will be proper to examine how far the respective *differences of longitude* agree with the intermediate distances, founded on such authorities as may be procurable; whilst, at the same time, the distribution of the intermediate space is effected. It is well known that accurate results of celestial observations for the longitude depend on such nice circumstances, that, unsupported by collateral proof, or by the established reputation of the observers, they ought to be adopted with caution. And if it happens that the results are at variance with the geographical authorities; or that the observations were made under circumstances that were unfavourable; they ought to be rejected altogether. It must be acknowledged, that in the present case, the reports of the distances, as far as the comparisons could be

made, have a general agreement with the observations.

This construction is explained by four Maps of Positions, which will be found, in the Atlas, under the numbers, IX. X. XI. and XII. In these all the principal positions and lines of distance are expressed; with the respective authorities on which they rest. The positions are distinguished, in respect of the importance which they bear to the construction, whether places of celestial observation, or from time-keepers; or latitude, simply; and whether by Europeans, or Orientals, &c. &c. The lines of distance are also distinguished; and whether they are relied on, as *data* for the general construction and scale, or only made use of to complete the detail. The Roman roads are also expressed with the distances; and the ancient names of places are *underlined.*

The first of these four Maps of Positions, No. IX., exhibits a general view of the construction of the whole geography from the Dardanelles to Ispahan; and from Ægypt to Russia; together with the Caspian Sea.

The second, No. X., contains Asia Minor and North Syria alone, on double the scale of the former.

The third, No. XI., contains the remainder of Syria and Palestine, on the same enlarged scale; as also several portions of the construction, in different parts, on a still larger scale, as the materials required.

The fourth, No. XII., contains that part of Rûm-Ili, adjacent to the sea of Marmora and the Euxine;

drawn also on double the scale of the general Map of Positions. It contains also two portions of the construction on still more enlarged scales.

This sheet contains also a chart of the Euxine, drawn for the purpose of explaining the observations on the Periplus of Arrian, contained in Book IV.

This memoir of the geographical construction is divided into five Chapters; of which, the first four are in Asia; and are, respectively, appropriated to the southern, the northern, the eastern, and the western quarters; and the fifth, which is in Europe, to Rûm-Ili. These Chapters are again subdivided into Sections, which have a progressive number running through the whole; by which an immediate reference may be made to the Maps of Positions; and, on the contrary, from the maps to the text.

Itinerary Measures, &c.

It becomes necessary to set forth the scale of the Itinerary measures, made use of in the construction of the geography; and in that of a country, where the distance is more ordinarily measured by *time*, a statement also of the scale of days' journeys and hours, under different circumstances. This we shall endeavour to accomplish in as short a compass as possible; since whole volumes may, and have been written on the subject.

The positive Itinerary measures of distance shall

first be mentioned; and of these, there occur, in the course of the construction :—

1. Roman miles, or *mille passus.*
2. Schoenes.
3. Stades.
4. Arabic miles.
5. Persian farsangs.
6. Turkish agatch.
7. Turkish miles.
8. Wersts. And,
9. German miles.

1. The Roman mile.

This is taken on the authority of M. D'Anville, at 75 to a degree of a great circle. (*Mes. Itin.* page 44.) This scale is obviously meant of a *straight line;* which is a form that roads cannot ordinarily take for any length of space. Enough is, however, known, to prove that in such parts of the Roman empire, as had been long settled, the great roads were formed on as straight a line as circumstances would admit; and, of course, such roads would have but a very small degree of inflexion.

But this will not apply to Asia; as is evident by a comparison of the numbers found in the Antonine and Jerusalem Itineraries; in the Theodosian Tables; and in other ancient documents. For, by a comparison of these numbers with the ground, the same degree of inflexion will be found that generally prevails, where roads are laid out with less attention to shortening the distance, than to immediate convenience in other respects. Such may be termed *natural*

roads; and the proportion of winding of such roads has been found to be about *one-ninth part* of the road distance; or, which is the same thing, *one-eighth* of the *direct* distance measured on a map, must be added, in order to obtain the *road distance.* And such being the proportion, 84 Roman miles, at least, must be allowed to a degree, in the application of these miles to geographical construction[1]; or for one mile 0·7143 G. miles.

2. Schoenes.

The schoene appears to be about 4 Roman miles; but has certainly no connection with that mile, being a Persian measure. It is generally taken precisely on the above footing; but appears to be rather under 4 MP.[2]

3. The Stade.

Of these, there were both Roman and Grecian. It was originally a Grecian measure; but afterwards applied by the Romans in the subdivision of *their* mile; which consisted of 8 stades. Hence, a degree consisted of 600 Roman stades only; although Strabo, following the Greeks, reckoned 700; and the mean of the different authorities among the Greeks, 718[3];

[1] M. D'Anville, in his remarks on geographical construction, also allows *one-ninth* part. His experience surpassed that of any other individual in those enquiries.

[2] The *schoene* appears to have been the Persian farsang under a different name. They are said to be of Persian origin; and are sometimes used by Strabo. The Itinerary of *Parthia*, by Isidore of Charax, is in *schoenes*. The scale of the schoene, in *direct* distance, is 2·86, if taken at 4 MP. It was probably less, approaching to the parasanga.

[3] See the Geographical System of Herodotus, &c. Vol. I. p. 24.

in the Euxine, taken around its whole circuit, about 708. These are the Grecian *Itinerary* stades, and have no reference to the Olympic, which never appears to have been used for Itinerary purposes.

When Polybius, Strabo, or Pliny, are speaking after the Greeks, or treating of Grecian matters, antecedent to their times; they always use the Grecian Itinerary stade; but in what concerns Roman matters alone, the Roman stade. Strabo, when following the route of Alexander, gives, of course, the identical *number* of stades, as well as the *quality*, which he found in the annals of the times; and, moreover, gave the distance, according to the number of stades *actually marched over;* so that, after all, it was necessary, in order to obtain the direct distance, to deduct the proportion of *winding* of the road.

Pliny gives those distances almost universally in Roman miles; in order, it may be supposed, to render the account more intelligible to his countrymen. It will be found that he turned the sums of Grecian stades into MP. by dividing by 8; which had the effect of increasing the distance, since it required about $9\frac{1}{2}$ Grecian stades to make a Roman mile. However, this will be found to be true, by those who compare the same distances in MP. in Pliny, with the stades in Strabo[1].

[1] It may thence be very much suspected that the authors were not aware of the difference between the Roman stade of $\frac{1}{8}$ of their mile, and the Grecian Itinerary stade. Otherwise, why confound them?

4. Arabic miles [1].

These, as appears by the measurement of an arch of the meridian, in the plain of Sinjar, by order of the Caliph Al Mamoun, about the year 825, are at the standard of $56\frac{2}{3}$ to the degree. Now, although this must obviously mean in *direct* distance, or it could mean nothing at all, yet this standard agrees universally with the distances given by Edrisi and Abulfeda, as far as a comparison can be made, by an application to known distances. So that these geographers reckoned as if they measured their distances from a map, or other geometrical projection. This, at least, appears clearly to be the case with Edrisi's distances; and, indeed, we learn that he constructed a terrestrial globe for Roger, King of Sicily, in the 12th century [2]. Possibly the distances given by him were those used in the construction of his maps and globe; and were, of course, measured in a straight line between the places on them. And Abulfeda, it may be observed, often copies him; and both of them Ibn Haukel; but Abulfeda more particularly.

The Arabian mile appears to be of considerable antiquity; for some of the distances in Syria, bordering on Arabia, that are given in the Antonine Itinerary and Theodosian Tables, agree to Arabian

[1] The term MILE has been applied, as in this case, to the Itinerary measures of different countries, although varying in length from $56\frac{2}{3}$ to 87 to a degree. The name of course originated in the Roman *mille passus*.

[2] This globe is said to have been of silver; and that it weighed 800 *marks*. D'Herbelot fixes the date at 1153 A.D. A mark appears to be half a pound troy weight.

miles; and were probably collected from the people of the country, who reported the distances in their own Itinerary measures; and which, through inattention, might have been copied into the Roman documents.

5. Persian farsangs *(parasangas.)*

The standard of this Itinerary measure appears to be composed of three Arabic miles; for the farsangs of Ibn Haukel and of Abulfeda are constantly given by Edrisi, when going over the same ground, in Arabic miles, at the rate of three to each farsang.

It has appeared, by the result of our enquiries into the scale of the modern farsang, that, on the great roads leading from Ispahan to the N. and NW., the farsang is considerably longer than any where else, and appears to be the full measure of 3 Arabic miles, or 3·68 British miles, *by the road.* The roads there, also, are much straighter than elsewhere, whence the *direct* distance bears a greater proportion to that by the trace of the road.

But the farsang, in almost every other quarter, appears to be 3 Geogr. miles, or less; or, in British road miles, about $3\frac{1}{2}$. We have taken a mean of 1224 farsangs, all to the *eastward* of the meridian of Ispahan; 624 being derived from one authority, 600 from another. The two *sets* of authorities differed, in *direct* distance, only as 2·662 to 2·63; giving a mean of 3·445 British miles, by the road. A third authority is from Colonel Malcolm's own experiments, and is 2·66 direct; by the road 3·5 or

3½. These three examples approach very close to each other.

There is, however, an instance of a *shorter* farsang, in the Journal of Mr. Forster, who travelled from India to Europe, through Persia, in 1783. His standard, on about 250 farsangs, is only 2½ G. miles *direct*, or 3¼ British, by the road.

If, then, a mean be taken of *all these farsangs collectively*, to the amount of more than 1600, it would be as nearly 3 G. miles as possible, agreeing with Colonel Malcolm's statement of 3½ British miles, by the road.

In order to apply the scale of the farsang to the purpose of geographical construction, the *direct* distance alone is to be known, and we shall here give it accordingly.

Colonel Malcolm's statement is . .	2·66	G. miles.
Mean of 600 farsangs, from modern travellers	2·63	
Ditto of 624, from Mount Sadik .	2·662	
Ditto of 140, on the great roads of Ispahan	3·000 [1]	

Hence, 2·653 G. miles may be taken as the general mean of the ordinary farsang; the roads to the N. and NW. of Ispahan excepted. It may be

[1] In road distance and British miles, the following are the proportions:

Persian farsang of three Arabic miles .	3·68
Colonel Malcolm's	3·5
The mean of the 1224	3·455

remarked, that Thevenot's standard, between Ispahan and Shiraz, is 2·62.

But the *ancient parasanga* was not so long. It was currently taken by the Greeks, of the days of Herodotus and Xenophon, at 30 stades [1], which, at 718 to a degree, are, as nearly as possible, $2\frac{1}{2}$ G. miles, or 2·9 British, by the trace of the road. Xenophon's farsangs appear to be equal to 3 Roman miles only, or 2·78 road miles, British; falling short of the former by about $\frac{1}{24}$ part, which, however, is scarcely worth regarding.

Herodotus has indeed given an account of the distance between *Sardis* and *Susa*, by which the result, in *direct* distance, is 2·49 G. miles; or by the road, 3·24 B. miles. But the statement of the 30 stades, in which both he and Xenophon agree, ought to supersede the other; since it is no more than an inference drawn from the distance on the map, compared with the number of *parasangas* in Herodotus.

It is probable that the near accordance of the ancient *parasanga* with 3 Arabic miles, might have induced the Saracenic conquerors of Persia to fix it as a standard, but that, as an entire change of Itinerary measures is, like that of weights and measures, very difficult to accomplish, it may only have been made permanent in the line of the great communications in use by the monarch or his court. A change

[1] Herodotus, in Terpsichore, c. 53, and Xenophon, in the Anabasis, lib. ii., where 535 parasangas are said to be equal to 16,050 stadia; that is, 30 to a parasanga.

was made in Hindoostan, by Acbar and Shah Jehan, in the length of the *coss*, but the old standard quickly regained its place, and the new one is only heard of in books.

6. The Turkish agatch.

This appears to be only another name for the Persian farsang, and prevails only on the borders of Persia, where a repeated change of territory has familiarized the Itinerary measures of Persia to the Turks. Tavernier appears to have been so much accustomed to both, that he uses them indifferently, even in the eastern part of Persia. In effect, the Turks appear to use no other measures of distance than *time*, (and Cantemir, who ought to have known, affirms it,) except in navigation. When European travellers in Turkey speak of leagues, hours are intended.

7. Turkish miles.

These appear to be much the same with the *werst* of Russia, and both are said to have been received from the Greeks; in effect, the Greek mile. M. de Beauchamp reckons these at 100 to a degree, but they are certainly of a much longer standard; for, on a comparison of them with the distances along the southern coast of the Euxine, they appear to be of 87 to a degree; that is, exactly the werst[1]. But in all the various reports of routes in Asia Minor and Rûm-Ili, the mile is never mentioned, and seems to be in use only on

[1] This mean is taken on 900 Turkish miles, along the south coast of the Euxine.

shipboard, like the nautic or geographic mile in our ships.

M. D'Anville reckons the Greek mile equivalent to 7 Roman stades, or about 86 to a degree.

8. Wersts.

This measure is taken, in the few instances in which it has been used, at 87 to a degree. It appears that the werst, the Turkish mile, and the Greek mile, agree within $\frac{1}{18}$ or $\frac{1}{19}$ of each other; consequently that they have the same origin.

9. German miles.

These are commonly taken for 4 geographic, or 15 to a degree of a great circle. They are only used on occasion of M. Niebuhr's distances, in certain places.

We come next to the distances that are measured by time; as days' journeys of various kinds, and marches of armies, and more particularly the *hourly rate* of travelling, which furnishes the best scale of all. Of days' journeys, there are the following varieties:

1. Ordinary journeys on foot.
2. Ordinary journeys on horseback.
3. Caravan journeys, either with camels or without.
4. Journeys specified by the Oriental geographers, and which appear to have been applied to geographical construction by Edrisi, Ibn Haukel, and Abulfeda.
5. Marches of armies.

1. Ordinary journeys on foot.

By these is meant the distance that people ordinarily travel on journeys, in contradistinction to *couriers*, or messengers; that is, professed travellers. This applies more particularly to Persia and India, where couriers always travel on foot; but not to Turkey, where horses are used for this purpose. The *ordinary* journey on foot hardly differs throughout the world. It is taken here, from the observation of the author, at 22 to 24 British miles by the road; and in direct distance, taking the mean, 23, at somewhat under 18 G. miles per day, for a single day, or two or three days; but when several are thrown together, as from 5 to 10, $17\frac{1}{2}$ G. miles may be sufficient, by reason of the *compound* winding that necessarily arises on any length of space. A single journey has only its own *simple* winding [1]. This scale is preferable to any other arising from time, for the purposes of geography; the *hourly rate* alone excepted [2].

2. Ordinary journeys on horseback, in Turkey and Persia.

These are the most uncertain of any, because they are not regulated by the comfort and convenience of the individual, as in walking journeys, but on the

[1] If $2\frac{1}{4}$ be allowed for the winding on 23 British miles, $20\frac{3}{4}$ remain for the straight line, and these are equal to 17·9, or nearly 18 G. miles. When $\frac{1}{9}$ is allowed for winding, 17·6 is nearly the result.

[2] Here it is proper to remark, that the *fractions* of days' journeys are rarely given; the larger being taken for *whole* days, and the smaller sunk in the whole days.

mere will or caprice of the horseman, who may be regardless of the comfort of the animal that carries him.

Much may be collected from Mr. Drummond's tours in Syria. He says, p. 124, "a day's journey *never exceeds thirty miles* (British, and *road distance* of course), though one must be on horseback from the rising to the setting of the sun."

In his routes, p. 287, on 33 hours, he reckons $3\frac{1}{2}$ miles *per* hour. In p. 289, on $79\frac{1}{2}$, 3 *per* hour, and on $8\frac{1}{2}$, 3 also. And in pp. 290, 291, on $56\frac{3}{4}$ hours, 3 miles. So that here are 145 out of 178 hours, at 3 miles only; that is, at all times, the *walk* of the horse.

Prince Cantemir, and the author of the Journey to Damascus, both state 3 miles per hour. The latter, indeed, says the *caravan*, and so does Dr. Howel: but these can only be caravans of horses and mules, since camels move at the rate of $2\frac{1}{2}$ only. In effect, they both meant a large cavalcade of persons on horseback.

Mr. John Sullivan's route through Asia Minor was under 3 miles per hour; for, on 88 hours, between Nicomedia and Toosia, he reckoned only 257 miles by the road, or 2·9 per hour. M. Otter's rate was about $3\frac{1}{4}$, on the same road. And, when travelling in the suite of the Turkish ambassador, in Mesopotamia, it was under $3\frac{1}{4}$, on 87 hours. Mr. Baldwin's, when compared with the ground he went over, between Kuniyah and Erekli, is only 3.

Mr. Drummond gives only one instance of $3\frac{1}{2}$ per hour, and that only on 33 hours. But there can be

no doubt but that it often occurs. Mr. Drummond doubtless *rode his own horse,* and was tender of him.

We may reduce these rates to direct distance and geographical miles (the mode in which they are applicable to geographical construction) as follows:

On $3\frac{1}{2}$	British miles	per hour,	2·66 or $2\frac{2}{3}$.
$3\frac{1}{4}$	ditto	ditto	2·49 or $2\frac{1}{2}$.
3	ditto	ditto	2·3 or $2\frac{1}{3}$.

It is obvious that when the number of hours can be obtained, the result will be more perfect than when days' journeys alone are given. But these are also to be resorted to very often. When taken *singly,* 30 B. miles may be allowed, or 23 G. miles direct. But on distances that require several days to perform them, and which induces the necessity of moderate and equal journeys, 25 or 26 may be amply sufficient. The journey to Palmyra, in 1678, was said to be 6 *easy* journeys, but as it was accomplished in 46 hours, they could have been only of $7\frac{2}{3}$ hours each, at a medium, and consequently of 20 G. miles each, direct; 26 British by the road[1]. And it appears, that, on the return of the other party, in 1691, they actually remark their time to be such, as to make up about $7\frac{1}{2}$ hours, during the 8 days that they were on the road, by Ain-al-koom and Baulas.

[1] The calculation was 150 miles; of course 25 for each day, but the *hours* warrant 26.

This slow rate of travelling, however, may not readily gain belief. M. D'Anville, by his mode of reasoning, in his Euphrates and Tigris, (pp. 39, 40,) does not appear to have considered this matter properly, nor does he seem to have clearly comprehended the length of military marches.

3. Caravan journeys.

Caravans are composed either of camels or mules, or mixed. It is obvious that, in the latter case, the camels, as the slowest paced, must regulate the rate of motion. When the camels are few in number, the other beasts are often allowed to proceed at their own pace, and the camels arrive late. Camels are in universal use in the south.

A caravan of loaded camels ordinarily proceeds at the rate of $2\frac{1}{2}$ British miles *per* hour, by the road, provided the number of camels is not more than one to two thousand, as between Aleppo and Basrah, and where the camels are of those countries; but in the Mecca caravans, in which the numbers are said to be sometimes 15,000, and made up of camels from Africa, as well as from Syria, &c., the rate is slower, from the increase of the number of delays, and from the different qualities of the animals themselves [1].

[1] Thevenot was informed that a caravan from Kahira, consisting of 15,000 camels, was a very large one; although vulgar report states the number at 100,000.

The caravan, between Aleppo and Basrah, consisted of 1000, according to Carmichael, in 1751; and of upwards of 2000, in 1745, according to Beawes. The caravan of camels for sale,

The caravans between Aleppo, Bagdad, and Basrah, of which we know the most, certainly go at the rate of $2\frac{1}{2}$ miles only per hour; and as the rate on the *straight line* is the result sought in this place, we shall here state it, as it was found, under different circumstances.

On the *whole line* of 422 G. miles, in *direct distance*, between Aleppo and Gersemy (near Mesjid Ali), the hourly rate, at a mean, on 205 hours, was 2·058, and traced through the principal stations, $427\frac{1}{2}$ G. miles, it was 2·085.

A second example occurs between Aleppo and Bagdad, 393 miles direct, and the time $193\frac{1}{2}$ hours, whence the result was 2·031. And through the principal stations, the distance was 398, and the result 2·057.

A third example was between Gersemy and Zobier (near Basrah), the distance direct 203, through the stations 206, the time 99 hours. And hence the results were respectively 2·054 and 2·084. The three examples are from three different journalists. The first and third have almost a perfect agreement; the second is somewhat under the others: and the cause clearly appears, from their having made a *detour*, in one point of their route, to avoid an enemy in the way.

The rate of the Mecca caravan falls so low as

travelling without loads, was said by Plaisted, in 1750, to consist of 5000.

Abdul Kurreem says, p. 132, that the Syrian camels are the largest and most powerful.

1·96, owing doubtless to the great number of camels, and the excessive length of their days' journeys.

But as the geographical construction of maps is founded on much shorter lines of distance, it will be proper to state these results likewise; as being the ones most applicable to the purposes of geography. Four portions of the road, between Aleppo and the neighbourhood of Mesjid Ali, have been measured, and calculated separately, as follows:

The first, of 48½ hours, across the level and open part of the Syrian Desert, and where the road is straight, gave	2·15
A second, of 48⅔ hours, across the contiguous desert of Arabia	2·137
A third, of 44⅓, over much uneven ground, gave . . .	2·07
And the fourth, with the road more crooked, 62¾ hours .	2·024

These may probably be reckoned the extremes of high and low rates: and, accordingly, the mean of the first two, 2·143, may be used for level and open deserts, the latter for the uneven ones, in cases where the nature of the surface has been described; in default of which, the general mean must, of course, be resorted to.

The journey of the loaded caravan across the deserts between Aleppo and Basrah, taken at 7½ hours each, and at the highest of the two rates, 2·143, is 16 G. miles, and a very small fraction, for a single day, or for a few days; but on a line of many days, reckoned together, about 15¾; and on very long lines, 15½. Such are the differences that arise between the *simple* winding of the road, or

track, on each day's journey, and that which arises both from *this* and from the divergence of many points in the route, from the general line of direction. And the two together may be not improperly styled the *compound* winding.

But the above calculation is taken on the *maximum;* for, at the mean rate of 2·087, a day's journey will be under $15\frac{3}{4}$; and the others, respectively, under $15\frac{1}{2}$ and $15\frac{1}{4}$ [1].

The caravans of Asia Minor, Armenia, &c. are said to go 3 miles *per* hour, road distance. This is the report of Dr. Howel and others; and, therefore, as well from this as from the reports of M. Niebuhr, respecting the number of hours employed on the routes in Asia Minor, and part of Armenia (com-

[1] In this Table, the examples of the camel's rate of travelling, reduced to direct distance, are brought into one point of view, for the accommodation of the reader.

On the whole Lines.			Through the Principal Stations.	
	Hours.	Geog. M.		
Aleppo to Gersemy	205	2·058		
Gersemy to Zobier	99	2·054	1,000 to 2,000 camels.	2·085
Aleppo to Zobier, in *one* line	304	2·049		2·084
Aleppo to Bagdad	$193\frac{1}{2}$	2·031	* small caravan (15,000 camels)	2·057
Damascus to Medina	$317\frac{1}{2}$	1·96		
On the level Desert between Aleppo and Battan Farda	$97\frac{1}{4}$	—	1,000 camels. mean 2·087.	2·143
Uneven Desert, Farda to Gersemy	$107\frac{3}{4}$	—		2·047

* The comparative lowness of the rate here appears to have been occasioned by a *detour*, to avoid an enemy.

municated by him to the author), we conclude that the caravans are not composed of camels. M. Niebuhr's routes across Asia Minor, in several directions, have proved of the greatest use in the geographical construction. The general mean arising from these routes (in Asia Minor), collectively, is 2·22 and 2·23; and on the long line between Smyrna and Anguri, about 2·25, or $2\frac{1}{4}$[1]. As it has been shewn (p. xlviii.) that a rate of 3 *road* miles produces 2·3 *direct;* the caravan rate in question cannot well be less than 2·9 road miles. M. Niebuhr's result is so satisfactory, that it would appear no better rule can be taken than 2·23 to 2·25, in Asia Minor.

It is evident, from what has appeared, that caravan rate, of both kinds, is the most to be depended on, from the equable rate of motion of such bodies.

[1] The following are the principal routes in Asia Minor, communicated by M. Niebuhr.

	Hours.	Rate.
Smyrna to Jaurkoi, mean of three reports	58	2·27
Jaurkoi to Begbazar	51	2·23
Iconium to Karahissar	47	2·23
Iconium to Degnizlu	70	2·29
Constantinople to Sakli	83	2·26
Brusa to Sakli	67	2·17
Hours	376	
General mean		2·227

It is said that camels are intermixed with the caravans of Asia Minor. As the above rate is above the *universal* camel rate, it can only be accounted for on the ground of Professor Carlyle's report. He travelled through Asia Minor, with a small party of horses, and some camels. It was their practice to wait some hours for the coming in of the camels, after a journey.

4. Specified journeys of the Oriental geographers, particularly Ibn Haukel, Edrisi, and Abulfeda.

Edrisi has repeatedly told us that his day's journey consists of 18 [Arabic] miles; which are 19·06 Geographic. Accordingly, as these are in direct distance, they cannot represent less than 24 to 25 *road* miles; and if meant for ordinary journeys, they appear to be taken at too high a rate. However, the specified number, in direct distance, is the point sought after; and this is given too unequivocally to be doubted. Not but that there are many instances in which a greater number of miles are given for a day's journey, but then they are *so expressed.*

Abulfeda appears to allow 24 Arabic miles, or 25½ Geogr., for each journey; which is the journey of a courier in India, about 33 road miles, or 100 in 3 days. But then he often allows the same number of days with Edrisi, over the same ground; and also allows at times 6 farsangs, or 18 Arabic miles. So that his scale of days is too uncertain for use; but may, however, be regarded as the same with Edrisi's.

Marches of Armies.

The *mean* rate of the daily marches of armies is much the same at all periods, and in all countries, since the physical powers of men are much the same every where. We have collected examples from a variety of quarters, and the result is somewhat above 14 British miles by the road, or about 12 Geogr.; and which, reduced to *direct* distance, is taken at

about 19½, on a line of 8 or 10 marches. A single march, or 2 or 3 marches, may produce 11 G. miles each nearly.

The mean of 95 *measured* marches of a Mogul army[1] was 11·6 road miles British; but the army was lightly appointed, and we conceive it to be the highest rate that prudence and humanity allow of. As for the hurrying marches of Alexander and Buonaparte, in which they shewed no feeling either for man or beast, whilst their thirst of domination continued, these are out of the question. We mean to speak of those commanders who only hazard their men's lives in hostile conflict. But it is to our point, that when Alexander marched from *Ecbatana* to *Rages* (Hamadan to Rey) in 11 days, which is at the rate of no more than 18¾ or 19 British miles by the road, for each day, Arrian says (lib. iii.) that although "many of his soldiers fainted on the road, and many of his horses died, through excessive weariness, Alexander still resolved to proceed at the same rate." The distance is unquestionable.

The marches of Cyrus and Xenophon accord very nearly with the *mean* march, not only on a comparison with the ground, but from the stated number of stades. For 5 *parasangas* of 30 stades each was an ordinary march, as appears by the *Anabasis;* or 150 stades to a march. And these being at the rate of about 718 to a degree, the 150 produce, of course, 11½ British miles for each march.

[1] There is a department in the Indian armies for this and other purposes; as, for regulating time, &c.

On the whole, then, the mean march, in *direct* distance, may be taken at 10·6 G. miles, or a small fraction over 14 B. miles by the road. And it appears that an increment of *less than one-third* produced excessive lassitude, and consequent loss of men and horses; for most of the men who drop in this manner, in hot climates, never rise again [1]. It is certain that Vegetius speaks as if the ordinary march of the Romans was 20 MP., or 18½ British miles; but there must be some error, unless they were unlike other men. The marches of Manlius and Scipio appear to be like those of other commanders.

It will now be proper to speak of the hourly rate of persons on foot in Rûm-Ili, Asia Minor, &c.

The ordinary walk of a man, who walks at his ease, and without any particular exertion, is from 3¼ to 3½ British miles *per* hour. The former of these rates has been stated (in p. xlviii) to be 2·49, or 2½ G. miles, in direct distance; and the latter 2·66, or 2⅔ [2]. The former will be found to prevail more commonly than the *latter*, which is rather the rate of messengers, or couriers. In the communications between town and town, at no greater distance than 10 or 12 hours, the rate of a man's walk is intended, by the town's people; and more commonly the lowest

[1] Very many persons are apt to consider soldiers on the march in the light of ordinary travellers, walking at their ease; and not as men *partially loaded*. Moreover, the unavoidable halts on the march, by lengthening the *duration* of them, produce a greater proportion of fatigue than would have arisen from the quantity of distance alone.

[2] It may be remarked, that the hourly rate of walking agrees to the modern farsang.

of the two. But on long journeys caravan rate is intended, as the town's people have seldom any knowledge of distant places.

In Rûm-Ili, the rate on the great roads from Constantinople is 2·6 G. miles direct, or by the trace of the road 3·38 British miles. This is taken on the whole extent of the road from Constantinople to Ismael, and from the former to Adrianople, compared with the Roman Itineraries. Also from Constantinople to Silistria, on the Danube; and also to Rodosto; the rate was respectively 2·6 and 2·67, or by the road 3·38 and $3\frac{1}{2}$ British miles.

It must naturally have occurred to the reader, that in arranging the proportions of the *direct* distance to the *road* distance, very different rules must be applied, when given in TIME, than when it is given in any ITINERARY MEASURE. For in the ascent or descent of a hill, no more than a tenth part of a mile may be gone over, more than the *direct* distance; but as much *time* might be lost, particularly by loaded beasts, as would have carried them over a quarter of a mile of level ground. The inflexions on the level ground are, of course, the same in both cases.

In order to relieve the reader from the trouble and delay of searching out the different rates of travelling, &c. before-mentioned, they are here brought into one point of view, reduced to *direct* distance.

Itinerary Measures.

1. Roman miles, each 0·7143 G. mile; or for 100, 71·41 G. miles, (p. xxxviii.)

2. Schoenes, about 4 Roman miles, or 3·86 Geographic, (p. xxxviii.)

3. Grecian Itinerary stades, taken at 718 or 720 to a degree; about 12 to a Geographic mile, or for one stade 0·0833, (p. xxxviii.)

4. Arabic miles, 1·055 G. mile, (p. xl.)

5. Persian farsangs; those of the Oriental geographers, 3 A. miles, or 3·177 G. miles, (p. xli.) farsangs in ordinary use, 2·653 G. miles, (p. xlii.)

6. Turkish agatch; the same, (p. xliv.)

7. Turkish or Greek miles, 87 to a degree, or for each 0·689 G. mile: the *whole* is *direct* distance being employed at sea only, (p. xliv.)

8. Wersts: these are of the same scale with the latter; only, that being employed at land, winding is to be allowed, and then each will be in direct distance 0·613 G. mile, (p. xlv.)

9. German miles; equal to 4 Geographic, (p. xlv.)

Distances measured by Time.

1. Ordinary journeys on foot, (p. xlvi.); for 1 to 3 days, nearly 18 G. miles; and for a greater number, $17\frac{1}{2}$.

2. Ordinary journeys on horseback (p. xlvii.) 23 G. miles.

3. Caravan journeys (p. xlix, *et seq.*); camels, for a few days, 16 to $15\frac{3}{4}$; for long journeys, $15\frac{1}{2}$ to $15\frac{1}{4}$ G. miles: mules, &c. 17 to 18 G. miles, (p. li. *et seq.*)

4. Specified journeys of the Oriental geographers, 19 G. miles, (p. liv.)

5. Marches of armies (p. lv.): for 2 to 3, 11 G. miles, nearly; for a greater number, 10·6 to $10\frac{1}{2}$.

Hourly Rates.

Men's walk, 2·5 to $2\frac{2}{3}$ G. miles, (p. lvi.), taken at $3\frac{1}{4}$ to $3\frac{1}{2}$ road miles; on the great roads in Rûm-Ili, 2·6 G. miles, (p. lvi.)

Hourly rates, of $3\frac{1}{2}$ miles British, by the road .	2·66,	or $2\frac{2}{3}$
of $3\frac{1}{4}$	2·49,	or $2\frac{1}{2}$
of 3, (p. xlviii.)	2·3,	or $2\frac{1}{3}$
of $2\frac{1}{2}$, camel rate, on lines of moderate length	2·143	
on very long lines, (p. li.) . .	2·085 [1]	

[1] For the satisfaction of the reader, here are given the scales actually arising on a great variety of distances, in time, used in the construction.

	Hours.	G. Miles.
In Rûm-Ili.		
Mr. Bell, Ismael to Burgos	97	2·6
M. Sturmer	60	2·6
Captain Hayes	20	2·6
In Asia Minor, &c.		
Mr. Browne, Brusa to Iconium, through Kutahiah, &c.	$81\frac{1}{2}$	2·62
———— Smyrna to Libad	51	2·39
Mr. Sullivan, Nicomedia to Amasia	129	2·2
Dr. Howel, ditto	123	2·31
Mr. Drummond, Syria, (horseback)	$179\frac{1}{2}$	2·45
Mr. Maundrell, ditto (on foot)	44	2·38
Mr. Ives, Bagdad to Mosul	$104\frac{1}{4}$	2·12
Dr. Howel, Hillah to Mosul	115	2·31
Major Leake, Isnik to Iconium	93	2·165
Caravans, in Asia Minor.		
Dr. Seetzen, Smyrna to Iconium	$121\frac{1}{2}$	2·24
Mr. Browne, Aintab to Nicomedia	$230\frac{1}{2}$	1·826

A Table of celestial observations for the latitudes and longitudes within the limits of the present work is subjoined. Very little use has been made of the Oriental Tables of latitudes and longitudes in this portion of the work; but in the part beyond the Caspian Sea and Persian Gulf much more; through the want of observations made by Europeans. It is to be regretted that these Tables should have been so much corrupted, as not to be relied on, implicitly. And that their present state is owing to corruptions, may be concluded from these circumstances: the difference of longitude between Aleppo and Kaswin is by celestial observation 12° 24′, and by the Tables 12° 50′ [1]; and between Kaswin and Canoge or (Kinnoje) by the construction (inferred from Agra,

Mr. Vaughan, Nicomedia to Amasia	143	1·99
M. Tournefort, Erzerum to Eski Shaher, *about* .	245	1·88
M. Tavernier, Allashaher to Tokat, *about* . .	254	1·53
M. Lucas	83	2·2
Mr. Carmichael, Arabian Desert, with camels (1,000)	205	2·058
——————— on the flat Desert	97	2·143
——————— on the uneven Desert . . .	108	2·047
Mustapha, Damascus to Medina	317	1·96

[1] That is, Aleppo, by observation . 37° 9′
Kaswin . . . . . 49° 33′
12° 24′

Aleppo, by the Tables . 72° 10′
Kaswin . . . . . 85°
12° 50′

the nearest point of observation), 30° 43′, and by the Tables 30° 50′; or only 7 minutes difference[1]. Or, if we take the whole difference of longitude between Aleppo and Canoge, the one in 72° 10′ of the Tables, the other in 115° 50′, there will be 43° 40′ difference of longitude; and by the construction, between 37° 9′ and 80° 16′, there will be 43° 7′, or an excess in the Tables, of 33 minutes on 43 degrees of longitude, equal in that parallel to 28¼ G. miles. Hence, it may be concluded that the errors generally proceed from the carelessness of copiers.

Within these forty years the longitude of Astrakan, in the best European maps, has been faulty by *two whole degrees,* in excess; although in a Turkish map made at Constantinople, in 1729, the error was no more than 18 minutes. Even after Dr. Graves, in the middle of the seventeenth century, had translated the Tables of Nasereddin, Ulegbeg, &c. they were disregarded; for although the longitudes in them gave the true breadth of the Caspian, and thereby proved that its length extended N. and S., not E. and W.; yet the maps continued the old error to a very long time; and although Olearius, who had viewed the whole extent of this sea, from

[1] That is, Kaswin, by observation . 49° 33′
Canoge, by construction . 80° 16′
30° 43′

Kaswin, by Tables . . . 85° 0′
Canoge . . . . . 115° 50′
30° 50′

Reshd on the south, to Astrakan on the north, and had made enquiries respecting the parts that lay beyond his view, described it to extend lengthwise, nearly in the direction of the meridian. For he had learnt to respect the general truth of the Tables, from what he saw, but could not convince others [1].

[1] These observations, both of latitude and longitude, are in number twenty-eight in all, scattered over the whole tract from the Danube to Ispahan, and from Egypt to Russia; besides those on the north side of the Euxine and its neighbourhood, in number seven more.

	Latitude.	Longitude.	
Aleppo, or Haleb	36° 11′	37° 10′	
Alexandria	31° 13′	29° 55′	
Arackali (Pontus)	41° 18′	31° 27′	Adopted 31° 25′
Asian Castle, (Dardanelles)	40° 9′	26° 19′	
Bagdad (Bridge)	33° 20′	44° 21′	
Balbeis	31° 33′ 36″	30° 25′ 36″	
Basrah	30° 30′	47° 33′	
Bucharesti	44° 26′ 45″	26° 8′	
Constantinople	41° 1′ 30″	28° 55′	Seraglio
Damietta	31° 26′	31° 49′ 15″	
Eno	40° 42′	25° 58′ 30″	
Gallipoli	40° 25′ 30″	26° 37′	
Hilla (Babylon)	32° 28′ 30″	44° 9′ 45″	
Ismael	45° 21′	28° 50′	
Ispahan	32° 24′ 30″	51° 50′	
Kahira	30° 3′ 20″	30° 18′	
Kaswin	36° 11′	49° 33′	
Lampsacus	40° 21′	26° 36′	
Mosdok	43° 43′ 40″	43° 49′	
Om-Farage (Egypt)	31° 9′	32° 30′	
Salaheh (ditto)	30° 48′	31° 59′ 30″	

Scanderoone . . .	36° 35′	36° 14′	
Selivra	41° 4′ 35″	28° 11′	
Sinub	42° 2′	35° 6′	Adopted 35° 1′
Smyrna	38° 27′	27° 7′	
Suez	29° 59′	32° 35′	
Trebizond . . .	41° 2′	39° 37′	Adopted 39° 28′ 30″
Astrakan	46° 21′	48° 2′	

It is proper to mention, that although the quantities given by M. de Beauchamp's observations at Trebizond, Sinub, and Arackali, are inserted in the Table, yet the longitudes *adopted* at those three places are some minutes less, as will be seen in the margin.

GEOGRAPHICAL CONSTRUCTION.

CHAPTER I.

THE SOUTHERN QUARTER

SECTION I.—*Line from Aleppo to Kaswin; with the principal Positions around Aleppo.*

ALEPPO may be regarded as the central point of the whole construction; being fixed by celestial observations, repeated; and sending out lines of distance in various directions.

The principal positions round about have been determined by compass bearings, by Mr. Drummond and others; the particulars of which may be seen in his Book of Travels. His tour of observation extended from the Mediterranean on the west, to the Euphrates on the east, and to Beer and Aintab on the north; that is, about a degree of longitude on each side of Aleppo, and a degree of latitude to the north. During this tour he collected information sufficient to enable us to determine the inland positions of Bab, Bambouch, Beer, Aintab, Rowaut, Corus, Killis, Antioch, and Souadieh, or *Seleucia*

Pieria; also Scanderoone, Arsous, and Bayas, on the Gulf of Issus. This tour is formed into a map, but with *magnetic* bearings only, and without latitudes: those defects are supplied by others.

The magnetic variation is approximated by the difference of latitude between Aleppo and Antioch, which is one minute to the north of the former, by the observations of M. Niebuhr.

Mr. Drummond's bearing is W. 8 N.: consequently, as the distance is 46 G. miles, the true bearing is about W. $1\frac{1}{2}^0$ N., and the variation must have been about $6\frac{1}{2}^0$ westerly, at that time, 1748[1]. In like manner the other bearings are cleared of variation. The scale is corrected by a reference to M. Niebuhr's corrected scale (they having both gone over the same ground between Beer and Antioch), and to the mean of a number of reports of the distances. And hence we have placed the following positions:

Beer, on the Euphrates, from Aleppo	N. 44 E. $66\frac{1}{2}$ G. miles.
[M. Niebuhr has	N. 48 E. 70.]
Antioch	W. 1° 30′ N. 46
Souadieh, (from Antioch) . . .	W. 13° 30′ S. $17\frac{1}{2}$
Bambouch, (from Aleppo) . . .	E. 19 N. $44\frac{1}{4}$
Aintab, (from ditto)	N. 16 E. $57\frac{1}{2}$
Corus, (from ditto)	N. 9 W. 39[2].

[1] Mr. Carmichael, in 1751, found the variation about $8\frac{1}{2}^0$ westerly, about midway between Aleppo and Bagdad. This, indeed, shews the variation of *his* small compass; but it cannot be doubted that the variation *decreased* instead of *increased* to the eastward of Aleppo. Drummond and Carmichael cannot both be right.

[2] See Map, No. X.

Scanderoone is placed generally, on the authority of the celestial observations at that place, in latitude 36° 35′, longitude 36° 12′, which is, however, 2 min. more to the west than the observation allows. Hence it falls precisely in the meridian of Antioch, which is 46 G. miles west from Aleppo.

Bayas is placed in reference to Scanderoone; combining the authorities of M. Niebuhr and of Mr. Drummond together. Respecting these positions on the Gulf of Scanderoone, or *Issus*, much more will be said respecting the detail in Book IV., where the Syrian and Cilician passes are spoken of.

Mr. Drummond's map also allows us to place Arsous *(Rhossus)* at W. 19 S., 15 G. miles from Scanderoone.

Some of these positions will be found of the greatest use as points of outset to distant stations; and all of them in arranging the detail of the geography [3].

[3] Mr. Drummond's Tours.

1st.	Aleppo to Bambouch . . .	E. 19 N.	44½ G. miles.
	To Beer	N. 8 E.	
	To Aintab	W. 15½ N.	31½
	To Corus	W. 34½ S.	33½
	To Sheik Baraket	S. 14½ W.	33
	To Aleppo	E. 12 S.	
2nd.	Aleppo to Antioch	W. 1·30 N.	46

Thence to Scanderoone, Bayas, &c.; and Antioch to Surmire, Kinneserin, and Aleppo; with excursions to Arsous and Souadieh.

Line from Aleppo to Kaswin.

The first line to be considered is that which traces the distances, and apportions the differences of longitude between Aleppo and Kaswin, two places of observation situated nearly in the same parallel, and at more than 13° asunder. And as M. Niebuhr's route forms a part of this line, and many positions in it may be regarded as points of outset, and the whole of it as a foundation or base of this part of the construction, it may be proper to begin with it, tracing it, however, from the opposite quarter; that is, in the order in which he travelled.

This illustrious traveller, to whose labours geography is deeply indebted, and to whose private friendship the author is indebted for communications of unpublished materials, proceeded from Basrah, a point fixed by celestial observation, up the Euphrates by water, to Lembloon, taking the bearings by a compass, and computing the distances the whole way; and taking also observations of latitude as often as opportunities offered. At Lembloon he disembarked, and went by land to Mesjid Ali, situated on the edge of the Great Desert, at 80 or 90 G. miles to the southward of Bagdad, and from thence to Bagdad itself. Here his operations, as applicable to this part of the construction, begin; and his observations previous to that belong to the Line, and article, No. 2.

From Bagdad M. Niebuhr pursued his route to the N. and NW. to Mosul; and thence, by way of

Diyarbekir, to Aleppo and Alexandretta, or Scanderoone. His computed distance, when uncorrected by observations of latitude, is taken too high; for it appears by the interval on his map, that he calculated the difference of longitude between Bagdad and Aleppo at 34½ min. too much, or about 28½ G. miles [4], or, stated proportionally, an excess at the rate of 2 in 27 [5].

It may reasonably be supposed, that, when the *course* was near the direction of the meridian (as between Bagdad and Arbel) M. Niebuhr corrected his distance, in the first instance, by the difference of latitude; and therefore the error must be looked for chiefly, if not almost entirely, between Arbel and Aleppo, where the distance consists chiefly of longitude.

Arbel (the ancient *Arbela)* is placed by M. Niebuhr at about 26 G. miles to the west of the meridian of Bagdad, equal to about 31′ 45″ of longitude, which, taken from 44° 21′, the longitude of

[4] Aleppo, by the *Con. des Temps*, is in . . 37° 9′
Bagdad, by M. de Beauchamp . . . . 44° 21′

Difference . 7° 12′

By M. Niebuhr's distances . . 7° 46′ 30″

Difference . . 34′ 30″

[5] Between Basrah and Hillah, the excess was in the proportion of . . . . . 2 in 23
In Asia Minor . . . . . 2 in 25
Between Bagdad and Aleppo . . . . . 2 in 27

Bagdad by M. de Beauchamp, places Arbel in 43° 49′ 15″. Its latitude is 36° 11′, and that of Bagdad 33° 20′. The intermediate positions between Arbel and Aleppo (or rather Beer, as that place is already adjusted, to Aleppo,) are then arranged, by subtracting from each interval the proportion of the $34\frac{1}{2}$ min. Accordingly the following is the result:

	Lon.	Lat.	
Mosul	43° 4′ 15″	36° 21′	by observ.
Beled, (or Old Mosul)	42° 40′ 30″	36° 32′ 15″	by construct.
Nasebin	41° 6′ 15″	37° 1′ 30″	by ditto.
Merdin	40° 36′ 15″	37° 19′	by observ.
Diyarbekir [6] . . .	40° 4′ 15″	37° 55′	by ditto.
Soverik	39° 22′	37° 46′	by ditto.
Orfah, (or Edessa) .	38° 51′	37° 9′	by construct.
Beer	38° 7′ 15″	36° 59′	by observ.

As no observation of latitude was taken at Orfah, which is a point of much importance in the construction, as a place of outset both to the north and south; it becomes necessary to state, that it is situated about midway between Soverik and Beer, whose latitudes are known; and that it lies SW. from Soverik, ENE. from Beer. The distances between them are given

[6] Diyarbekir is given differently, at different times, in the *Con. des Temps;* and so low as 39° 10′ and 39° 20′ in 1787 and 1789. But the Baron Zach reports an observation of M. Triesnecker, in 1801, at 57° 31′ 35″ E. of Ferro, or 39° 52′ 35″ E. of Greenwich, which is 11′ 40″, or somewhat more than 9 G. miles to the westward of the position assigned by M. Niebuhr. The observations of the same gentleman would place Aleppo in 37° 13′, Smyrna 27° 14′ 30″, which we have taken at 37° 9′, or 37° 10′, and 27° 7′.

by several different authorities, and in a very satisfactory manner; so that there is little doubt but that its position is well approximated. There is, moreover, a bearing of it from Beer, given by M. Niebuhr, which agrees with the adjustment of the distances; and these place it in latitude 37° 9′ [7].

M. Niebuhr's line is of the utmost importance to this construction, for his observation of latitude and computed distances (the latter corrected in the manner described, and to which there appears to be no just exception,) fix the several principal points, and assist in fixing others. It will presently appear how well the positions of Nasebin and Mosul, derived from his authority, agree with the cross distances given by Abulfeda, Edrisi, and others. It is, however, certain, that through the want of an observation of longitude at Mosul, or Arbel, the position of the eastern limit of Mesopotamia (the Tigris) is not so well ascertained as might be wished. This will be better understood by a reference to the map of positions No. IX. M. Niebuhr's authority for it ought, however, to be regarded as the first, on its own merits.

The cross lines of distance, for the verification of M. Niebuhr's line, require great length of discussion, but their object is not confined to *that* alone, since they determine by the way many useful positions

[7] Distances between Beer and Orfah.

M. Niebuhr, 10 German miles, or (bearing ENE.)	40 geographic.
Thevenot	18 hours.
Vaughan	16 ditto.
Hajy Kalifa	15 ditto.

from whence *other* lines and *positions* are derived. The principal line in question proceeds from Aleppo, across Syria and Mesopotamia, to Nasebin *(Nisibis,)* whilst a second leads from Orfah to the same point; and, finally, the line between Nasebin and Mosul will be examined. Some collateral lines of distance necessarily arise in the course of verifying the principal ones.

The distance from Aleppo to Bambouch (or Mambedge, the ancient *Hierapolis* of Syria,) is given by Mr. Drummond at 44¼ G. miles E. 19° N. and this is confirmed generally by Messrs. Niebuhr and Maundrell. The bridge of Bambouch is said by Schultens to be four farsangs beyond the town; and this passage was also known to Strabo[1]. It was the pass between Syria and Nasebin (Nisibis); Julian crossed the Euphrates here, in his way from *Hierapolis* to *Charræ,* or Hauran.

If the four farsangs be taken at 12⅔ G. miles, there will be an aggregate of 56·9, from Aleppo to the bridge of Bambouch; from whence Edrisi allows (page 203) 2 days, or 38 G. miles to Hauran; so that the total to this place (as they all lie in a direct line) will be 94·9; or say 95 G. miles.

The parallel of Hauran appears to be about 36° 40′ or 41′. M. Niebuhr says that it is two journeys SSE. from Orfah; and in his map he allows 30 G. miles, placing it also in 36° 41′. By its distance from Bambouch it should rather bear S. by E. The

[1] Strabo states the distance to be four schœnes, or about 16 Roman miles; 11½ G. miles *direct.* Ibn Haukel says, an *easy* day's journey. The fortress of Nejm commanded it.

tables of Nasededdin and Ulegbeg place it in 36° 40′; longitude 50 min. east of Aleppo. (One degree and 50 min. would agree pretty nearly; and it is to be remarked, that the degrees of longitude in the above tables, as well as those of Yacutus, for Racca, Ras-al-Ain, Nasebin, Sinjar, Mosul, and many other places in Mesopotamia, are respectively *one* in number *less* than they ought to be in respect of Aleppo; but right, if taken in respect of each other).

The longitude of Hauran, taken on the distance above given, is 39° 2′ 45″, and its parallel may well be taken at 36° 40′ [1].

Sarug *(Batnæ Sarugi)* is said by Edrisi to be one journey from Hauran, and the same distance from the bridge, but it lies wide to the north of the road. See No. X.[2]

From Hauran to Nasebin, through Ras-al-Ain, which will also be found to lie in the direct line from Aleppo and Hauran, to Nasebin, is said by Golius, (p. 242), who quotes Yacutus, to be 30 farsangs, or 95¼ G. miles [3], and that Ras-al-Ain lies exactly mid-

[1] Both Edrisi and the Theod. Tables appear to be mistaken with respect to the distance between Hauran and Orfah.

[2] The Theodosian Tables allow 46 MP. between Hierapolis and *Batnæ*, and thence to Hauran 30; which aggregate of 76 MP. is equal to 54¼ G. miles *through Sarug*, which lies so far wide of the direct road, as to increase the distance 3½ miles by the circuit. Hence, if we add 50¾, taken for the direct distance between Bambouch and Hauran, to 44¼, the distance of Bambouch from Aleppo, we have an aggregate of 95 G. miles, agreeing nearly with the former distance.

[3] Abulfeda allows six days between Hauran and Nasebin; Edrisi three between Ras-al-Ain and Nasebin.

way. It will be proper to establish the position of this place in the first instance.

The 15 farsangs (47·6 G. miles) have a near agreement with the 67 MP. of the tables between *Charræ* (Hauran) and *Ressaina* (Ras-al-Ain), equal to about 48 G. miles.

Benjamin of Tudela allows two journeys between Hauran and Ras-al-Ain, and the same between the latter and Nasebin; and his journeys on such roads as are known, are equal to 23 or 24 G. miles in direct distance. These will, therefore, be found to agree with the former reports.

The Oriental tables give for the parallel of Ras-al-Ain 36° 50′, and for its longitude one degree east of Hauran, which, on the bearing between them, gives 49 G. miles. In effect then, Ras-al-Ain may be placed at somewhat more than 48 miles from Hauran, and in latitude 36° 50′ [1].

Ras-al-Ain was a city of considerable note and of great antiquity in the centre of Upper Mesopotamia, under the names of *Ressaina* and *Ressania*. Its position is at the source (or the principal one) of the River Kabour (the *Chaboras* and *Aboras* of the ancients, and the *Araxes* of Xenophon), and about 25 to 30 miles to the southward of *M. Masius*. M. Niebuhr was told when on one of the summits of that ridge, at Merdin, that Ras-al-Ain was 12 to 14 leagues to the SW. Its name properly signifies the *head of the spring*, or fountain, (being situated at

[1] It will appear that both Edrisi and Ibn Haukel allow four days between Ras-al-Ain and Racca, which is consistent with the position here given.

the reputed source of the Kabour); but, as in a variety of other instances, it has become the proper name of the city. It may be conceived that *Ressaina* was a corruption of Ras-al-Ain by the Romans, as the superior antiquity of the Arabic language cannot be doubted. In the position which this place occupies on the construction, according to the above result, the interval between it and Nasebin is $50\frac{1}{2}$ G. miles.

Neither the 15 farsangs of Yacutus, nor the two journeys of Tudela, come up to this distance by two or three miles, and the three journeys of Edrisi (page 203) go beyond it by six or seven. The mean of the three comes within a mile. It must be recollected that Abulfeda also allows three days.

There are two other reports of the route between these places, but circuitously; the one through Merdin, the other through Karadara *(Dara)*. Merdin is determined by latitude, and by bearing and distance from Nasebin.

Gunaser or Kojhissar *(Duneisira)* is said by Golius, from Yacutus (p. 242), to be 10 farsangs from Ras-al-Ain; and more modern authorities allow four hours NE. and SW., between Gunaser and Merdin[1]. The latter at the same time lies NW. by W. $12\frac{3}{4}$ hours from Nasebin, according to Mr. Ives. Add to these the SW. bearing of Ras-al-Ain from Merdin, in lat. 37° 19′, and the distance of 50 or more G. miles will be made out between Ras-al-Ain and Nasebin.

[1] Gunaser is $13\frac{1}{2}$ hours W. by N. from Nasebin.

Edrisi has a road from Nasebin to Racca, in which the *River* Khabour is mentioned, but not Ras-al-Ain. But one can scarcely doubt but that this place is intended, being in the very line from Karadara, through which the road passes, and at the general distance required; Karadara is $6\frac{3}{4}$ hours from Nasebin, (Ives, &c.) in the road common to Merdin, Ras-al-Ain, and Orfah; and by Edrisi 15 Arabic miles, or nearly 16 Geogr. (ENE. northerly). From thence Edrisi gives 36 A. miles, or about 38 Geogr. to the Khabour; total 54 G. miles through Karadara; and about 51 or more on a direct line from Nasebin to Ras-al-Ain.

Between Hauran and Nasebin we measure on the construction $99\frac{1}{2}$ G. miles, of which the 30 farsangs of Yacutus fall short by $4\frac{1}{4}$ miles. But the line through Gunaser (Yacutus's also) of 10 farsangs, seems to shew that he has allowed too little in the 15 farsangs between Ras-al-Ain and Nasebin; and that little, if any, is wanting to make out the distance. In effect, that M. Niebuhr's line from Bagdad to Aleppo agrees so far with the reputed distances.

It remains that we should examine the distance between Orfah and Nasebin, of which we have three different reports, by Olivier, Otter, and Tavernier, with a part of it by M. Thevenot. That of Tavernier is not correct enough. Otter was 46 hours between Orfah and Nasebin; the space on the construction is 107 G. miles, through *Gunaser* (or Kojhissar) giving a rate of 2·33, which is rather low, considering that he travelled with a party and not in a caravan. Olivier was 45 hours between Orfah and

Merdin, through Meskiouk. The rate here is less than 2. Neither of these reports would lead us to suspect that Nasebin is placed too far to the east.

It is proper to mention in this place, that the position of Diyarbekir on the construction, differs about a fourth of a degree from the tables in the *Con. des Temps;* the observation reporting it in 39° 50′, whilst our distances give 40° 4′ 15″. This observation, if true, would bring Diyarbekir upwards of 11 G. miles more to the west, a space equal to nearly five hours travelling. It is true that the line of distance between Aleppo and Diyarbekir is very long; but then the space between Aleppo and Beer is corrected by the latitude and bearing; so that about 110 miles only remain: and for these there are the authorities of several persons.

First, from Beer to Orfah. In the note to page 9 several reports are given, by which the mean distance is taken at 37 G. miles, on an ENE. course, estimated by M. Niebuhr. That gentleman also calculated the distance at 10 German miles, or 40 Geographic, which, by a correction of 2 in 27, gives about 37. The mean of the time employed by the others was $16\frac{1}{3}$ hours, fully justifying the same result. Moreover, Mr. Vaughan, who was not a slow traveller, was 16 hours on the road.

Next, from Orfah to Diyarbekir. Hajy Kalifa gives the whole distance at 30 hours; and there are nearly 74 G. miles on the construction, giving a rate of 2·46, or nearly $2\frac{1}{2}$, which appears high. However, he allows no more than 15 between Beer and Orfah,

which gives precisely the same rate; so that there is a great consistency throughout.

A second report of the distance is jointly by M. Niebuhr and Mr. Vaughan. The latter reckoned 18 hours to Soverik, which give a rate of $2\frac{1}{4}$, ($40\frac{3}{4}$ miles), and his rate was 2·3 between Orfah and Beer. This route crosses *M. Masius*, or Karadgy Dag, which might occasion the difference. And from Soverik to Diyarbekir, M. Niebuhr allows $10\frac{1}{2}$ German miles, or, corrected, 39 Geographic; but no more than $35\frac{3}{4}$ appear on the construction. It is understood that the country is remarkably rough within this interval.

Hence, through Soverik, the distances in detail, $40\frac{3}{4}$ and $35\frac{3}{4}$, give $76\frac{1}{2}$ G. miles; but the angle made by the two lines at Soverik, reduces the direct line between Orfah and Diyarbekir to less than 74.

We cannot perceive that any exaggeration has taken place, in the adjustment of these distances; therefore the observation for the longitude of Diyarbekir is rejected, on the ground mentioned in page 8.

Mr. Ives and his party travelled from Diyarbekir to Beer; but the circumstances of his journey were such, that his rate was very slow. He was $57\frac{3}{4}$ hours on the way, and the distance measured, through Incessu and Mulaserai, is no more than 112; consequently his rate was only 1·94. (Between Bagdad and Arbel it was 2·12, with a party; and between Mosul and Diyarbekir, with a caravan, 2·19.)

M. Niebuhr, when at Soverick, supposed that he

was within 22 G. miles of the Euphrates. If he had any intelligence respecting the distance, it is to be regretted that he did not insert it in his book. We cannot suppose the Euphrates to be nearer than 37 G. miles to Soverik.

It will be for future geographers to enquire whether these positions are relatively just; but unless the longitudes and latitudes are taken at central points, through Asia Minor, Mesopotamia, &c. nothing exact can be performed. We have been compelled to work through Asia Minor, on a line of 13 degrees of longitude, without one celestial observation; and across it, in lines of 4 to 5 degrees of latitude, under the like disadvantages. We now proceed to the subject of the line from Nasebin to Mosul.

There are no less than eight reports of this route. But as *caravan*, or *ordinary* time is the properest for our purpose, as being the most reduceable to rule, we shall omit Mr. Vaughan's, as he travelled at an unusually quick rate. The other seven are

	Hours.	G. Miles.	
M. Niebuhr	53	111	Caravan Rate.
Ives	$46\frac{1}{4}$	—	
Thevenot	$47\frac{1}{2}$	—	
Olivier	$48\frac{1}{2}$	—	
Otter	$42\frac{1}{2}$	—	Quick.
Abulfeda	—	104	
Edrisi[1]	—	108	
Mean	$47\frac{1}{2}$	$107\frac{2}{3}$	

[1] Nasebin to Tal Nadjsæ, 12; Adraman, 15; Barcaid, 18;

The interval on the construction, between Nasebin and Mosul, is $104\frac{1}{2}$ G. miles; giving a rate of $2\frac{1}{4}$ to the mean time of $47\frac{1}{2}$ hours, which is also that of M. Thevenot, who seems to have been careful in noting the intervals of time. It is remarkable how nearly Thevenot's, Olivier's, and Ives's agree.

Abulfeda and Edrisi go beyond all, save M. Niebuhr; but still the difference is not great. We have preferred the report of the caravan route, which, it must be allowed, agrees remarkably well with the *corrected* distance of M. Niebuhr [1]. The reader is referred to the map No. XI. D., for the detail.

There is a route in Abulfeda, from Diyarbekir to Mosul, by Sered *(Tigranocerta)*.

Diyarbekir to Sered	4 days [2]	
Sered to Mosul	5	
	9 at 19,06 G. miles	$171\frac{1}{2}$
The construction, through Sered, has		$177\frac{1}{2}$
Excess on the construction		6

However, this is much too coarse a material to be placed in competition with the reports of the time between Nasebin and Mosul, or the observations of M. Niebuhr.

Maeliamun, 18; Beled, 18; Mosul 21; total 102 Arabic miles; 108 geographic. (Edrisi, p. 201.) Abulfeda's line is incomplete.

[1] That is, reduced in the proportion of 2 in 27.

[2] M. Niebuhr also reports 4 days.

Jezirah (or Jezirah-ibn-Omar) is a station connected with this line, and a future point of *outset.* It lies on the Mesopotamian side of the Tigris, to the ENE. of Nasebin. It is very much misplaced in M. d'Anville's Euphrates and Tigris, and also in M. Niebuhr's map; and its latitude in the Oriental Tables is equally wrong, 37° 30′; for it cannot be beyond 37° 12′ 30″; or bear more to the north from Nasebin than east 14° or 15° north. Here are the authorities.

Mr. Sullivan and the Abbe Sestini, who travelled together, reckoned it 22 hours from Nasebin, to the northward of east. Dr. Howel reckoned 19, and Mr. Ives was told 21. Adopting Mr. Sullivan's report, we allow 46⅓ G. miles.

Between Jezirah and Mosul, Mr. Sullivan and Sestini reckoned, at a mean, 39; Ives was told 40. The road being difficult and circuitous, and a ridge of mountains being crossed (where the Ten Thousand fought the battle on the hills, on the 10th of March), only 72⅓ can be allowed; and the intersection of the two lines places Jezirah in lat. 37° 12′ 30″, long. 42° 1′ 20″, and E. 14½ N. from Nasebin.

The mountains of Karaday-Dag, or Masius, according to M. Niebuhr, close on the course of the Tigris, at about 11 G. miles to the NW. of Jezirah. At this point, it is supposed that the Ten Thousand were compelled to ascend the Carduchian mountains.

For the detail of the construction, between Nasebin, Jezirah, and Mosul, see No. XI. Letter D.

From Mosul, placed as above (page 8), in

lat. 36° 21′, long. 43° 4′ 15″, we proceed to examine how far the interval on the construction, between it and Kaswin, agrees with the reports of the distance.

It happens that, neither in the northern line through Maraga (or Meraughah), nor in that by the south, through Shahrazour and Hamadan, the distance is *direct;* but on the contrary, very circuitous. The northern line passes through Ormia (or Roomya), Maraga, Meiana, Zengan, and Sultanieh, and ascending to the parallel of 37° 20′.

Abulfeda allows 40 farsangs between Mosul and Ormia; situated, by the Tables, in 37° latitude, and on the western side of a lake, occasionally denominated from that place, or from Maraga, but said to be also named Shahee. Taking these at 127 G. miles, and laying them off to the parallel of 37°, the long. of Ormia will be 45° 36′. But M. Niebuhr reports it to be five journeys from Arbela, which, taken at $95\frac{1}{4}$, fall short of the former position by $2\frac{3}{4}$ G. miles.

Maraga, a city well known in oriental history, from its containing the observatory of Nasereddin Toussi, is situated at the SE. side of the lake Shahee. Abulfeda gives the distance between it and Ormia at 30 farsangs, but as the circumstances of the case point rather to 13, we may be allowed to take 41 G. miles. (In fact, these two towns are only separated by the *breadth* of the lake, which is short of 60 miles *in length.*) Maraga is in latitude 37° 20′, and the distance of 41 from Ormia, places it in longitude 46° 22′, being 3° 18′ E. of Mosul.

The Oriental Tables give 3° west of Kaswin, or 46° 33′.

From Maraga to Kaswin, in a general direction of ESE. (as that from Mosul to Maraga has been to the ENE.,) the line of distance may be considered as made up of three parts :—1st, Between Maraga and Meiana, where the two roads from Maraga and Tabriz to Kaswin unite. 2d, Between Meiana and Zengan, where the former road unites with that from Ardebil. And 3d, Between Zengan and Kaswin.

The first part is given by Abulfeda at 2 days, or 38 G. miles, and the latitude of Meiana is given at 37 degrees. Thence we follow Chardin to Zengan, 20 farsangs, or 63½ G. miles, provided the road had been straight: but this is not the case, as not only the great ridge of Mount Perdelis intervenes, but the road is also in a deep curve; 60 miles only are therefore taken to the parallel of 36° 30′, given for Zengan in the Tables.

Between Zengan and Kaswin are reckoned 22¾ farsangs by Olearius: 23, by Della Valle: 24, partly by Abulfeda, partly by Della Valle: for which, at a mean, 23¼ may be taken, or about 73¾ G. miles. There are then the several numbers of 38, 60½, and 73¾; total 172¼ G. miles; or deducting 1¼ for the angle at Zengan, 171, between Maraga and Kaswin, giving a difference of longitude of 3° 14′, which added to 46° 22′, gives 49° 36′ for that of Kaswin, or 3′ only to the eastward of the observation.

It may be remarked, however, that although the latitude of Maraga may probably be depended on,

from the circumstance of its being the observatory of Nasereddin, yet that the same dependence cannot be placed on that of Ormia, especially as it is given at a *whole degree.*

SECTION II.

Line connecting Aleppo and Orfah with Bagdad and Basrah.

THIS line connects the four places of celestial observation,—Haleb (or Aleppo), Bagdad, Hilla, and Basrah; as also Bagdad with Orfah, &c., and the whole collaterally with Mosul and Nasebin.

It is proper to state that the direct line from Aleppo to Bagdad, the nearest place of observation, is partly made up of *positive* distances; partly of *proportional* ones; and that, in order to ascertain the scale of the proportional distance, an examination of the whole line of the *desert route* from Aleppo to Basrah must be gone through. It will, in the end, appear that the proportional scale is more exact, in respect of its parts to each other, than that of the positive distances.

In order to trace the line, now under consideration, through its several inflexions, and thereby to explain the geographical construction founded on it, it is also necessary to have recourse to the collateral aid of *cross* lines of distances, from certain known positions, arising in the foregoing line; as Beled, Nasebin, &c.

The journal of Mr. Carmichael's route across the Great Desert, between Aleppo and Basrah, in 1751 [1], manifests a great degree of perseverance, in the attempt to ascertain the rate of motion of a caravan of *loaded* camels, on a very long interval of distance, determined by astronomical observations. The author declares that he was determined to keep a register of the courses by a compass, and to compute the distance on each course, by counting the steps or paces of the camel, on which he rode, during a certain interval of time, and afterwards by measuring a number of them on the ground. But although he failed in his attempt to ascertain the positive distance, yet his process has furnished others with the means of apportioning the detail of the distances throughout. For as the length of the whole interval is given by the celestial observations at Aleppo and Basrah, and a *traverse table* by the journal, the *data* are complete. And when the reader is informed, that Mr. Carmichael's whole line of bearing, by compass, about 720 British miles, (by the road 750 nearly,) coincided with the bearing line given by the celestial observations, by which it appears that the error could amount to no more than the mean quantity of the variation, which was from

[1] For this, and many other favours, the Author stands indebted to his worthy and philanthropic friend, Dr. Patrick Russell, so well known also for his writings on the subject of the plague, the History of Aleppo, &c. &c. The History of Aleppo was begun by his brother, Dr. Alexander Russell, but so enlarged and improved by Dr. Patrick, that it may almost be deemed a new work.

6 to 7 degrees at that time[1]; he will give Mr. Carmichael credit for taking incredible pains, as well as being very accurate. And it is possible, that even a portion of the error may have arisen from the imperfection of his instrument, which was nothing better than a small pocket compass. Between Aleppo and Mesjid Ali, the difference was only 1° 40′, the road being much more straight between those places than between the latter and Basrah.

The rate of the camel's movement appears to be, beyond all others, the least variable, whether we examine it by portions of days or of hours; and therefore the intermediate distances, throughout this line, may be supposed to be well proportioned. This we are warranted in saying, from the examination of several other journals across the same desert, and particularly on that part of it between Aleppo and Mesjid Ali, where the route seldom varies, or, if at all, in a very small degree; which is by no means the case over the Chaldean desert, or that between Mesjid Ali and Basrah. For the better understanding of this particular, the reader is referred to the maps of comparative geography, No. V. and VI., and the two maps of positions, No. IX. and XI.

Between Aleppo and Annah, on the Euphrates, the same regularity prevails, in point of time, and in rate of motion: the examples on each route are as follow:—

[1] At a point, about midway between Aleppo and Bagdad, the variation was 8½ west, in 1751, by Mr. Carmichael's observation. It decreased eastward, so as to be at a medium, throughout, 6½ degrees.

	Carmichael.	Capper.	Hunter.	
From Hagla[1], one stage beyond Aleppo, to Uklet Hauran . .	117·40	119·45	116·30	hours.
Hagla to Al-Kadder . .	171·30	174·30	168	
Al-Kadder to Rakama, near Mesjid Ali .	193·15	194·20	187·30	

	Irwin.	Holford.
And from Aleppo to Annah	128[2]	126·42

It is unnecessary to produce any more examples to prove the *nearly equal* rate of motion of loaded camels, (or indeed of camels under ordinary circumstances); and, of course, that, provided the bearings are taken with ordinary care, and the ground does not vary remarkably in its surface, great dependence may be placed on the distribution of the distance along the line of such a route[3]. It appears in two instances by a comparison of the *road* distance with the *direct* distance; the first by Mr. Carmichael, the latter by Mr. Irwin; that the mean hourly rate of travelling of a caravan of loaded camels is 2·478 British miles in *road* distance; Mr. Carmi-

[1] Hagla is the point taken for the commencement of the account, as the caravan halts there, and the passengers join it from Aleppo, from which it is distant about 11 hours.

[2] Mr. Irwin calculated the distance from Aleppo to Bagdad at 493 road miles, British, and the distance appears to be 480.

[3] Examples of comparisons between three persons over the same ground:—

1st. — $80\frac{1}{8}$, and $78\frac{2}{3}$.
2d. — $117\frac{2}{3}$, $119\frac{3}{4}$, and $116\frac{1}{2}$.
3d. — $53\frac{3}{4}$, $54\frac{3}{4}$, and $51\frac{1}{2}$.
4th. — $171\frac{1}{2}$, $174\frac{1}{2}$, and 168.
5th. — 128, and $126\frac{2}{3}$.

chael's journal gave 2·475; Mr. Irwin's 2·48; and we have adopted $2\frac{1}{2}$ *per* hour [1].

Although the *proportional* distances alone on this line are to regulate the Geographical construction; yet it may be proper, for the use of others, to mention the proportions between the *road* distance (or the time on the road) and the direct distance; as well on the whole line to Mesjid Ali, as on certain portions of it. For in the application of this scale to future maps, a line of 200 hours would give a rate too low for ordinary construction, in which lines of a moderate length would more probably be wanted.

It appears, then, that on the whole line direct of 422 G. miles between Aleppo and Gersemy, 205 hours, the rate was 2·058 per hour; but measured through the points of Ain-al-Koom, Jub Gannam, and Kubessa, $427\frac{1}{2}$ miles, it was 2·085.

That the same distance measured in detail, and a rate applied to each portion, which appears to be a mode the most applicable to future constructions, as being lines of six, seven, or eight days' journey, the results are as follow:—

	Hours.	Rate.
Aleppo to Ain-al-Koom	$48\frac{1}{2}$	2·15
Ain-al-Koom to Battan Farda . . .	$48\frac{2}{3}$	2·137
Battan Farda to Kubessa	$44\frac{1}{3}$	2·07
Kubessa to Rackama	$62\frac{3}{4}$	2·024

[1] Mean of five experiments . . 2·51
— of seven estimates . . 2·35
— of Carmichael . . . . 2·475
— of Irwin . . . . . 2·48
See Phil. Trans. for 1791.

It appears to the author, that the two first of these, the mean of which is 2·143, is the proper rate for distances of six or seven days, on the *open* desert; where there are no impediments to a direct course, since that part of the route consists of a sandy or gravelly soil, and is almost perfectly straight. But the other two, whose mean is 2·047, lead either through a hilly desert, or one that has impediments in it, to the making of a direct course. In consequence, observant travellers will be aware what rate they ought to allow whilst passing through these two descriptions of country; but those who work up the routes of others, and do not possess a detail of the particulars, may be safe in taking a general mean of the four; which is, strictly, 2·087; or, roundly, 2·1; and which scarcely differs from the above report of 2·085, on the whole route.

It will be proper to remark, that between Aleppo and Bagdad, on a direct line of 393 G. miles, Mr. Irwin's result is 2·031; and on 398, through the prominent points of the route, 2·057; falling short of Mr. Carmichael's, but so little different, as to prove the general truth of the statement [1]. This observation, also, may be made, that on a level desert loaded camels *may* proceed 13 journeys consecutively, at the rate of 2·14 *per* hour.

As we are thus furnished with a scale for Mr. Carmichael's line, by means of the whole distance

[1] It will appear by the Map No. V. that Mr. Irwin's party made a considerable *detour* to the southward, through the Syrian Desert, and which may account for the difference of rate between Mr. Carmichael's 2·058 and Mr. Irwin's 2·031.

corrected by astronomical observations at its extremities, his labours are *almost* as useful to general geography as if the space had been actually measured throughout. In effect, the inflexions of the roads were noticed with so much attention and care, that his route serves as a *master line* for all the other routes on the desert; and affords no mean substitute for the deficiency of celestial observations between Aleppo and Hilla: moreover, it will be found to accord in its parts, generally, with the distances given by Edrisi [1].

There are FOUR points in this line that will admit of correction, by a reference to other authorities already established; these, therefore, it will be necessary to investigate very fully, especially those which affect the parallels, which, of course, are the most defective parts of a line that has so much obliquity from the meridian: they are, 1st, Mesjid Ali, in whose neighbourhood, Hilla, the longitude was determined by celestial observation; 2nd. Hit, which corrects the line of distance in an important point; 3rd. Ain-al-Koom, and, 4th. Rahabah Malek, both of which correct the parallels between Aleppo and Hit.

I. Mesjid Ali, or the Mosque of Ali, is situated on the edge of the Arabian Desert, towards Bagdad, and in the neighbourhood of ancient Babylon. Hilla

[1] The road between Aleppo and Mesjid Ali nowhere diverges more than 24 miles from a straight line drawn from one to the other, (and that for the purpose of coming to the Euphrates); and in other places from 5 to 7 only.

having also been determined in longitude by celestial observation[1] by the indefatigable M. de Beauchamp, it is conceived that Mesjid Ali, situated about 30 miles to the southward of it, and at the apex of a triangle, of which the base extends from Hilla to Dewana, in the direction of S. 34° E., 40 miles, according to M. Niebuhr, and has its length determined by the latitudes of the two places, cannot be much misplaced.

Hilla is in the parallel of 32° 28′, Dewana in 31° 56′: the distance of Mesjid Ali from Hilla, by M. Niebuhr, is given at 9 leagues, (or rather farsangs,) which, at 2·94 G. miles each, (as between Hilla and Bagdad 18 leagues gave 53 miles by the difference of lat.) are equal to $26\frac{1}{2}$, or 27. The bearing by compass was SSW. $4\frac{1}{2}$, and S. $4\frac{1}{2}$, of course S. by W. on the whole. The variation, 7° allowed, leaves for the true bearing, by this account, S. $4\frac{1}{4}$° W. But, as M. Niebuhr calculated the bearing too much easterly between Hilla and Bagdad, we correct the former (on the like proportion) to S. $6\frac{1}{2}$° W., distance 27 G. miles.

From Dewana the distance is $26\frac{1}{4}$, in a W. by N. direction. Rahmany, or Roomya, lies between; $6\frac{1}{2}$ from Dewana, 20 from Mesjid Ali, by Capt. Holford. (See No. IX.)

The intersection places Mesjid Ali in lat. 32° 1′ 30″, lon. 44° 7′ 15″, and in a bearing of W. by N. from Dewana, as is described. There is, moreover, a second line of bearing and distance to Mesjid Ali,

[1] Its longitude is 44° 9′ 45″, latitude 32° 28′ 30″.

from Lembloon, and which would be more satisfactory than the other if it was not so long. This is by M. Niebuhr, and is N. 53° W. 42 G. miles, corrected. The latitude of Lembloon was also taken by him, 31° 43′; but that of Dewana by Mr. Ives's party.

It is but justice to remark, that the bearings, as well as the general distances between Lembloon, Mesjid Ali, Hilla, and Bagdad, by Texeira, and Mr. Ives's party, as far as they respectively go over the same ground with M. Niebuhr, have a close agreement; but, prepared as he was, his authority must, of course, supersede all the others.

It is proper to remark, that Mr. Carmichael's route approached no nearer to Mesjid Ali than 7 miles to the W. by S.; that is, to Gersemy, a halting place on the desert route: so that, in calculating the time and distance up to Mesjid Ali, this allowance must be made; Mesjid Ali itself is 427 G. miles in direct distance from Aleppo; but Gersemy, to which the 205 hours [1] apply, is no more than 422 miles, 5 being the difference when the obliquity of the 7 is allowed for.

Properly considered, the two parts of the line under discussion, which are on the different sides of Mesjid Ali, are distinct, in respect of the *proportional* distance, since the observation at Hilla is in effect transferred to Mesjid Ali, whose position cannot be much out, considering the shortness of the

[1] In the Philosophical Transactions the time, 204 hours 20 min. is reckoned only to Rackama: Gersemy is 45 min. to the E. by N. of it.

distance, and the checks applied to it. It will accordingly be found, in the sequel, that the rates have a shade of difference in the different parts of the line, owing, no doubt, to the crookedness of the route between Mesjid Ali and Basrah, very different from all the other routes; and probably on occasion of threatened danger in the direct route. (See the sheet of Comparative Geography, No. VI. and the Map of Positions, No. IX.)

It appears since M. de Beauchamp's observation at Hilla was made known, (and which was long subsequent to the date of the paper on the travelling of camels in the Phil. Transactions of 1791,) that Mr. Carmichael's traverse, had there been no check at Mesjid Ali, would have placed this Mesjid no less than $11\frac{1}{2}$ G. miles nearer to Aleppo; and $10\frac{1}{2}$ min. of latitude more to the north. This was owing to the faulty position of Mesjid Ali and Hilla previous to the observation; so that it is very fortunate that we are in possession of the means of correction. The adjustment of Mesjid Ali rendering the line between it and Aleppo perfectly distinct from the remaining part, which will in future be another distinct line between Mesjid Ali and Basrah, we proceed to the examination of the remaining three points of Ain-al-Koom, Rahabah, and Hit.

Mr. Carmichael's route having been laid down on a proportional scale between the two points of Aleppo and Mesjid Ali on the construction, the above three points, as given by his traverse, were noted preparatory to the examinations; and, perhaps, it may be the best way to anticipate the different

results which occasioned such tedious discussions, for the use of those who may not be inclined to go through them.

	Carmichael.	Corrected.	
Aleppo to Ain-al-Koom	E. 43 S.	E. 35 S.	The corrected position is 13 G. miles more to the NE.
Ain-al-Koom to Rahabah Malek	E. 14 S.	E. $17\frac{1}{4}$ S.	Do. NE. northerly $8\frac{1}{2}$ miles.
Thence to Hit	E. $29\frac{1}{2}$ S.	E. $31\frac{1}{2}$ S.	Do. NE. by E. $4\frac{1}{4}$.

Hence, the greatest error in parallel is under 10 miles; the least $2\frac{1}{2}$.

The mode of applying the corrections, which were lines of distance drawn from some established position, was this: the line was laid off towards the point intended to be corrected in Mr. Carmichael's line, and made to intersect with *both parts* of it successively: (that is, the two parts of the line divided by the point to be corrected:) and finally, a *medium* point was taken for the result, so as to preserve the proportional distance throughout. But the differences were so small as never to exceed *two* miles in the line of Mr. Carmichael between the *original* and the *corrected* position, so as to render it a matter of no importance whether the line from Orfah to Ain-al-Koom; that from Orfah and Beled to Rahabah; or that from Bagdad to Hit, was the first examined. But as Hit is situated in a part of the line which most requires correction or corroboration; since in that place it diverges most from a direct line; and moreover has a line of distance to it from Bagdad; it may be proper to enter on it first.

II. Hit (the *Is* of Herodotus, meant for *It*) is a town near the Arabian side of the Euphrates, and in the neighbourhood of the most celebrated bitumen fountains. In point of general position, it is midway between Aleppo and Basrah. It is situated 93 Arabic miles, equal to 98½ Geogr. from Bagdad, *through* Anbar, on the road leading to Rahabah Malek, and Racca. Edrisi's report of the distance is corroborated generally by Abulfeda, who allows 30 farsangs (at three miles each.) The only difference is, that Abulfeda allows 30 miles, instead of Edrisi's 36 from Bagdad to Anbar; and 60, instead of the other's 57, thence to Hit. The bearing to Anbar is west, southerly, and from thence to Hit, WNW. so that the angle may be allowed to reduce the distance two miles.

We have also two modern reports of this distance. The first is by Mr. Evers, 45½ hours: the other M. Olivier, 45. Both went with caravans, and on a straighter road than by Anbar. The Arabian geographers' reports may be reduced to 96½ G. miles direct. Olivier's rate may be taken from 2·1 to 2·2 *per* hour, or 98 G. miles, and we have allowed 97½.

The latitude of Hit is wanting in modern catalogues. Nor does it appear amongst those of Nasereddin and Ulegbeg. Golius says that it is 33° 45′. Mr. Carmichael's traverse gives 33° 41′, which is coming very near to Golius's report, on whatsoever authority it may be founded. There is no check from the north or south to correct it.

According to Mr. Carmichael's traverse, Hit falls

at 100¼ G. miles from Bagdad, which is no more than 3¾ beyond the distance given by Edrisi; and is a very striking coincidence, if we consider the extreme difference in the nature of the materials. We have compromised these small differences by adding a mile to the distance of Edrisi from Bagdad, and shortening Mr. Carmichael's distance two only, instead of 3¾. And finally, by placing it in lat. 33° 43′ 15″, instead of the 45 of Golius, and the 41 of Carmichael.

III. Ain-al-Koom is a warm mineral spring on the Great Desert route, at the extremity of the Syrian desert. Its general situation is about 100 miles to the SE. of Aleppo; 40 south of the Euphrates. By Mr. Carmichael's original traverse, it would stand E. 43 S. 104 G. miles from Aleppo; lat. 35° 1′ 15″; but it is 10 or 11 min. more to the north.

To correct this position there is a line of distance from Orfah, through Racca: so that, in order to trace it with effect, the position of Racca, as well as several other places, must first be settled.

Racca *(Nicephorium)* was a city of considerable note, on the northern bank of the Euphrates, five journeys to the east of Aleppo. Its latitude was fixed by the celebrated Al Battani, at 36°, or 36° 1′; but its longitude is corrupted in the tables, and is a grand *desideratum,* as it affects the positions of Palmyra, Hems, and Kirkisia. At present it rests on the authority of two lines of distance; the one from Aleppo, the other from Orfah; and, viewed in the light of general geography, it will, no doubt, be

found placed consistently with the surrounding positions.

Baulus *(Barbalissus)* once a flourishing town on the south bank of the Euphrates, stood at three journeys from Aleppo, and was its reputed *port* on that river, when a constant communication existed between Syria and the East. It is given by Abulfeda at 15 farsangs, or 47½ G. miles from Aleppo, in the way to Racca and Bagdad.

Some English gentlemen who visited Palmyra in 1691, returned to Aleppo by way of Resafa and Baulus. They were about 19 hours in going from this latter to Aleppo; and for which 2⅔ per hour may be allowed, but as the horses went many of the last hours over ground they were accustomed to, two or three miles may be added for the acceleration of pace, and 53 G. miles may be allowed on the whole, instead of the 47½ of Abulfeda.

Sir Robert Shirley (in 1598) went from Aleppo to Baulus, by the circuitous route of Bab. This place is 24 miles distant from Aleppo to the NE. by E. Shirley arrived within four or five miles of Bab the first day, and went in two more to Baulus, SE. by E. from Bab. (It is to be understood that he did not go through Bab, but left it to the northward four or five miles). Allowing 38 G. miles for the two days, it will agree with the former result.

The latitude of Baulus in the Oriental Tables is 36° to 36° 6′, which appears probable.

There is some further light thrown on the parallel of Baulus, and on the distance of the nearest part of the Euphrates to Aleppo, by the following notices.

Sherby fountain occurred in the route of the travellers from Palmyra, at seven or eight hours to the eastward of Aleppo. Dr. Pococke went from Tedif ($4\frac{1}{4}$ G. miles from Bab) to Sherby in three hours, on a *south* course. The doctor's rate may be taken on this excursion at $2\frac{2}{3}$; and therefore Sherby, at eight miles south from Tedif, must stand somewhat to the S. of E. from Aleppo. Fay, a very remarkable and copious fountain, lay seven hours from Sherby towards Baulus (to the eastward, of course), but, unluckily, no bearing is given on this line; though it may be inferred, that in an open country, the first and second half of a road, to the same place, would lie nearly in the same direction.

Fay was four hours to the north-westward of Baulus; one hour to the west of the Euphrates. We have here a pretty satisfactory proof that Baulus must lie more southwardly than Aleppo: and also that from Sherby to Fay the course is rather to the S. than to the N. of east; as it is clear from Dr. Pococke that Sherby is to the south of Aleppo; and we may, therefore, conclude, that Baulus may be in the parallel of 36°, or thereabouts, as the Tables represent.

As the Euphrates is known to make a deep bend to the westward at Rajik, before it changes from the southern course, which it has held from *Samosata*, to east, towards Racca, &c. there is little doubt but that Fay, at one hour from the river, lies opposite to this bend, and to Rajik. This appears to be clear from what is found in the Theodosian Tables. It may be allowed that the *Hierapolis*, *Eragiza*, and *Bar-*

balissus found there, are the Bambouch, Rajik, and Baulus of our times. The Tables allow 16 MP., $11\frac{1}{2}$ G. miles, between *Barbalissus* and *Eragiza*, 25 from thence to *Hierapolis* [1]. And as Rajik does really stand in relation to Bambouch and Baulus, as *Eragiza* to *Hierapolis*, and *Barbalissus*, these circumstances amount to something more than presumptive proof of the truth of the parallel and general position of Baulus [2]. There are no cross lines of distance to this place, save the one just mentioned, which gives 28 G. miles on a SSE. course from Bambouch to Baulus. And Bambouch is in lat. 36° 26′, by the bearings of Drummond and Niebuhr, whence Baulus should be in 36° nearly.

Thus the position of Baulus may be fixed at 53 eastward from Aleppo. Edrisi gives no positive distance, but mentions it as a third station out of five, towards Racca; first Nauria, Kosciaf, Bales. If we regard them as days' journeys, which appears probable, the distance would be 57 miles.

Abulfeda says that Racca is 12 or 13 farsangs from Baulus, and the latter 15 from Aleppo. Of the 12 or 13, the first five or six are to Jiabar, the other seven, thence to Racca. The travellers from Palmyra (in 1691) reckoned seven or eight hours between Jiabar and Baulus; for which $20\frac{1}{2}$ may be allowed; and when they were at Aff Dien $12\frac{1}{2}$ to 13 hours to the ESE. of Baulus; or about $34\frac{1}{2}$ G.

[1] That described by Lucian.

[2] Rauwolfe, during his navigation down the Euphrates from Beer, in 1674, was told at *Cala* (a place not known) that Aleppo was only two journeys distant. They must be long ones.

miles direct; they were told that Racca was not *many* miles lower down the river. However, the expression is too vague to be attended to; and it appears to be disproved by facts, which will appear in the course of the discussion.

Since then Abulfeda allows seven farsangs or $22\frac{1}{4}$ G. miles between Jiabar and Racca; and we have made out $73\frac{1}{2}$ between Aleppo and Jiabar (i. e. 53 and $20\frac{1}{2}$), here is an aggregate of $95\frac{3}{4}$ (circuitously) from Aleppo to Racca; for which $93\frac{1}{2}$ only are allowed, because the Euphrates makes a deep bend to the south, between Rajik and Racca: the Palmyra travellers remarking, that from Aff Dien they went north-westerly during most of the way to Fay fountain [1].

Having thus traced the *eastern* line from Aleppo to Racca, we shall proceed to trace the southern line from Orfah and Hauran.

The position of the latter has been already fixed in the line to Mosul, in lat 36° 40′; lon. 39° 2′ 45″. Between Hauran and Racca, Edrisi's line of distance is, Hauran to Bageran, 12; Bageruan, 21; Racca, 9; total, Arabic miles, 42, or $44\frac{1}{2}$ Geogr. The meeting of the line of $93\frac{1}{2}$ from Aleppo with the parallel of 36° 1′, allows an interval of 39 only, between the point of intersection and Hauran; but as Bageruan lies equally in the road from Racca to Ras-al-Ain, as to Hauran, the 42 may well agree.—See No. IX. and X.

[1] They went first four hours westerly, and then north-westerly to Baulus.

Racca will then stand in lat. 36° 1′, lon. 39° 3′ 30″. The *Con. des Temps* has 38° 50′ only, which would shorten the distance from Aleppo 11½ G. miles. The Oriental Tables allow 1° 5′ difference of long. between Aleppo and Racca, although it appears to be nearly two degrees.

Edrisi's line of distance between Racca and Ras-al-Ain is imperfect in detail; but Ibn Haukel and he both allow 4 days, or 76 G. miles: the interval on the construction is only 68. We now proceed to unite Racca with Mr. Carmichael's station at Ain-al-Koom.

The connecting point between Ain-al-Koom and Racca is Resafa, or Arsoffa. It occurs in the route of the travellers from Palmyra to Baulus, and also in Edrisi's line from Hems and Tortosa on the sea coast. It also appears in the Theod. Tables, in a route from Palmyra to *Sura* [1], a town on the Euphrates, above Racca, (and, in effect, probably *to*

[1] Sura is mentioned by Procopius, (Persian War, lib. i.) and it appears to be one *march* above Racca, (then called *Callinicum*). If this be taken at 10½ G. miles, it will, with the 21 M.P. of the T. Tables, equal to 15 G. miles, make up the 24 Arabic miles between Racca and Resafa, allowed by Edrisi.

Sura, according to Procopius, was the frontier town of the Romans, towards Persia, on the south of the Euphrates. The boundary was 10 M.P. beyond it, and must have been nearly opposite to Racca.

It should be remarked that Procopius places *Sergiopolis*, taken for Resafa, at 15 miles *only* from *Sura*.

Balbi (1579), in his way down the Euphrates, remarked *Surieh* and *Belet-Surieh* (a castle, more probably Kalat-Surieh) between Jiabar and Racca. No distance can be inferred.

Racca itself, as the 10 miles beyond *Sukka* would agree with it.)

The distance of Resafa from Ain-al-Koom is from the above travellers; from Racca by Edrisi, (and apparently from the Tables also); and from Baulus by the same travellers.

They were 10 hours on the way to it, from Ain-al-Koom; for which $2\frac{2}{3}$ may be allowed, or $26\frac{2}{3}$ G. miles. As to the bearing, it may be taken at about *a point* to the east of north; for they remark, that on the *two* preceding days, they went on the first NE. and on the other NE. or *more* easterly; and on the day between Ain-al-Koom and Arsoffa "more *easterly than before*;" and from Arsoffa to the Euphrates, at Aff Dien, "*north, a little east.*"

Here it is proper to remark, concerning the bearings set forth by these travellers, that all of them, between Palmyra and Aleppo, appear to decline too much to the *right hand;* that is, either too much to the *east* of *north,* or to the *north* of *west,* than can be reconciled to the general construction founded on the observations of other travellers. For instance, it is generally allowed that Ain-al-Koom bears almost due north from Taiba, and Mr. Carmichael affirms it; as also, that Soukney, or Sukanæ, bore S. by W. from Taiba; but the travellers report the *whole* to be north easterly [1]. And on this ground

[1] Scarcely any thing can be more vague than the guesses of inexperienced persons concerning bearings: they often lay out of the question the sun's declination, and determine their east and west from the place of his rising and setting. But the travellers

one is led to conclude that Resafa bears but little to the E. of N. from Ain-al-Koom, and Aff Dien to the W. rather than to the E. of N. from Resafa, since their NE. turns out, when cleared of half a point of westerly variation, to be NNE. Accordingly, we have placed Aff Dien to the N. by W. $12\frac{1}{3}$ from Resafa; and Aff Dien will then bear due N. from Ain-al-Koom, 39 G. miles in direct distance.

Baulus has been already placed, (page 38.) To that place from Aff Dien the Palmyra travellers made the following remarks: they went first *west* about 4 hours, and then NW. about $8\frac{1}{2}$, in all $12\frac{1}{2}$ or 13 hours, on a general course of W. 32 N.; the rate allowed $2\frac{2}{3}$, or $34\frac{1}{2}$ G. miles, *direct*. The intersection of this line from Baulus, with the 39 from Ain-al-Koom, placed according to Mr. Carmichael's traverse, falls in latitude 35° 40′ nearly, or 21′ S. of the parallel of Racca; therefore, it at once proves that Ain-al-Koom must be much farther to the north, because Edrisi states the distance between *Resafa* and Racca at 24 Arabic miles, or nearly $25\frac{1}{2}$ Geographic. And Resafa, as we have seen, is upwards of 12 such miles to the S. a little E. from Aff Dien; so that, should Aff Dien take the position assigned, the interval between Resafa and Racca would be $35\frac{1}{2}$ instead of $25\frac{1}{2}$. Ain-al-Koom, in consequence, must be about 10 min. more to the north than Mr. Carmichael's bearings allow.

Resafa must at all events lie nearly in the line between Ain-al-Koom and Racca: if, then, we con-

in question had a compass with them, and one concludes that they neglected to attend to it as they ought.

sider it in this way, Resafa is 26⅔ from Ain-al-Koom, and also 25½ from Racca, total 52; or, in a direct line, 51½ G. miles. The result, then, becomes a simple line of 51½ miles from Racca, to meet Mr. Carmichael's proportional distance from Aleppo, 104 G. miles. And the intersection will be in lat. 35° 11′, long. 38° 54′ 30″, or 8 min. west of Racca; which, of course, places Ain-al-Koom.

From this corrected position of Ain-al-Koom, Resafa and Aff Dien will assume a more probable position; the latter, at 39 G. miles from Ain-al-Koom, and 34½ from Baulus, will be 14 or 15 from Racca; whereas, in the former position, it was 25, so as to destroy altogether the meaning of the phrase of "*not many miles distant*," for even 14 or 15 carry it to the utmost extent of the meaning. It may be added, that Jiabar could not have preserved its relative situation to Racca, and also lain in the road to it from Aleppo, had Ain-al-Koom remained in its original position.

It is highly probable that the road from Racca to Resafa is a part of the ancient road between *Edessa* (Orfah) and Palmyra, two renowned cities; and that Racca was the pass over the Euphrates between them.

IV. Rahabah Malek.—This is the last of the points for correction in Mr. Carmichael's line. This *site*, for the city no longer exists, is on the eastern or Mesopotamian side of the Euphrates, about midway between Aleppo and Bagdad.

Before the authorities for its position are adduced,

it is proper to remark that there appear to have been two places of the name of Rahabah, one on each side of the Euphrates, besides the removal of one of them to a new site, 1 farsang lower down the river. But the places here intended are 23 G. miles distant from each other.

It is therefore necessary that the discussion of the two positions should be gone through, as well for the purpose of identifying the place intended by Messrs. Carmichael and Beawes, as by Edrisi, for without that it will be impossible to apply the lines of distance satisfactorily. And it happens that lines pass through it, not only between Orfah and Bagdad, but to Palmyra and Damascus also.

Truth, however, compels us to say, that we have not met with any traveller who has identified both of them in modern times. But then it is to be considered, that the one spoken of by Ibn Haukel in the tenth century, and by Edrisi in the thirteenth, may be a different one from that mentioned by Abulfeda in the fourteenth, and by others since that time, and which is still in existence, though greatly dilapidated.

The name Rahabah has been applied to many cities as well on the Syrian as on the Mesopotamian side, and appears to be an original Arabic name: it is found under the form of *Rabbah* and *Rabbath*, as the names of the ancient capitals of the *Ammonites* and *Moabites;* and the latter is still called *Rabbat* and *Rabya* in Abulfeda and Hajy Kalifa: but in respect to the former, which was the most famous in Scriptural times, it is now sunk, although Ammon

remains. The term has been applied to several other places; but in the present case it seems probable that these Rahababs did not both exist at the same time [1].

The Rahabah now in existence is named Meshed (or Mesjid, *Mosque)*, Rahabah, and is situated about 10 G. miles below the conflux of the Kabour river with the Euphrates, and on the west or Arabian side of it. Olivier and Tavernier visited it in their way by land, Balbi and Rauwolfe in their way down the river in boats, Della Valle saw it from a distance. All these (Tavernier excepted, who is silent,) agree that it is on the west side.

Abulfeda places it 3 farsangs below Karkisia (at the conflux of the Kabour), but in *Mesopotamia.* He says that it was built by Malek ibn Tauk; that it fell to ruin, and was rebuilt at a short distance from the ancient site by Sourkooh ben Mahomed, in Abulfeda's own time, (the fourteenth century). Hajy

[1] Rabbah, or Rabbath-Ammon is spoken of in 2 Sam. xi. and xii., and in 1 Chron. xx. In the former it is denominated "the royal city of Ammon," and "the city of Waters," as there are several copious springs there. Josephus also speaks of it in Antiq. VII. It was here that Uriah was so treacherously slain during the siege.

Cellarius and others regard the term Rabbah as equivalent to *Great.* The author's friend, Dr. Wilkins, says "Răhăbăh, large, convenient, spacious (place or city);" which may be taken as a comment on the former. And in Gen. xxvi. 22. *Rehoboth* indicates *room*, or a large space.

The *Rehoboth by the river*, in Gen. xxxvi. 37, may have been "*the city of Waters*," or Ammon, and is very unlikely to have been in Mesopotamia, as the passage relates to a king of *Idumea.*

Kalifa confirms it, and fixes the exact date in A.H. 721, or A.D. 1321; but he says nothing concerning its position, more than that it was in Jezirah *(Mesopotamia)*. It is probable that both these authors meant the town west of the river, (that is, Meshed Rahabah,) but confounded with their descriptions certain particulars belonging to the other, which they might not have heard of distinctly.

Olivier saw, at the distance of 4 miles to the south of *his* Rahabah, the ruins of a place named *Meshed;* this may have been the remains of the *first* city mentioned by Abulfeda, but, by mistake, described to be *higher* up, when it was *lower* down the river. This circumstance, however, seems to shew that the western city was the *Meshed* Rahabah. A castle on a hill is also mentioned by most authors, and serves to shew that it was also the Meshed Rahabah visited by Tavernier.

There is no question, then, respecting the existence of one city of Rahabah, on the west side of the Euphrates, and at 9 or 10 G. miles below the mouth of the Kabour. But this position is utterly irreconcileable to that of the city pointed out by Edrisi and Ibn Haukel; as well as to Mr. Carmichael and Mr. Beawes. Nor is it at all extraordinary, that a city that was in a flourishing state in the tenth century, should no longer exist in the fourteenth, when Abulfeda wrote[1]. We shall proceed to state the authorities on which our opinion is founded.

[1] It must be recollected what a number of other cities have disappeared in the same quarter.

Ibn Haukel, an oriental geographer, who wrote in the tenth century, and is very often quoted by Abulfeda, speaks of a Rahabah on the *eastern* bank of the Euphrates [1]. Edrisi, in the thirteenth, does *the same*, and says also, that it is two journeys below Karkisia, at the mouth of the Kabour. Tudela, who visited *a* city of Rahabah in the twelfth century, says that it is a day's journey from Karkisia, and his journeys were of 23 to 24 G. miles in direct distance.

The journal of M. Olivier seems to prove most clearly, that the Rahabah to which he came was not the same pointed out to Carmichael and Beawes, and it will appear, that the place so pointed out to them agrees, within two miles, to Edrisi's line of distance from Hit; but in order to apply M. Olivier's distance with effect, it will be necessary to enter into some detail respecting the distances between Annah and Karkisia, along the Euphrates, as also those of Carmichael and Irwin, between Jub Gannam and Rahabah; Rahabah and Annah [2].

The trace of the road along the Euphrates, in the

[1] Ibn Haukel (p. 59) says "Rahabah Malek-ben-Tauk is a town, well watered and planted with trees, situated on the *eastern* side of the Forat river (Euphrates)." He adds, that Heit, or Hit, is on the western side of the same river, as are Jasir Menje (Membedge) and Samisat, and that Tacrit is on the western side of the Tigris; all of which is known to be true.

Edrisi says merely, that "Rahabah Malek-ben-Tauk is situated on the eastern bank of the Euphrates," (p. 199.)

[2] That the subject of Rahabah may not be broken in upon, the account of the placing of Annah is given at the end of this article.

line that people commonly travel, avoiding the ordinary windings, is 118 G. miles along the Arabian side, 110 along the Mesopotamian, and the difference is owing to the deep curves that the river makes towards the Arabian side. This statement is also consistent with the route given by Isidore of Charax, (along the eastern banks,) who reckons 37 schoenes (of 4 M.P. each), equal to 148 M.P., or about 106 G. miles.

M. Olivier, who came by the Arabian, or longest side, went from Annah, 46¾ hours, to a station 1½ hours short of Rahabah Meshed; that is, 48¼ hours *home to* that place; and reckoning at his former rate of 2·12, these amount to about 102 G. miles. Karkisia was said to be 3 farsangs higher up; that is, 9 or 10 miles. Here then, we have 111 miles out of the 118. But it is very probable that, as Olivier was *seven days* on the road with a caravan, it was more than 102 miles, and rather 105. But the chief point is, that Olivier made 48 hours and upwards between Annah and Rahabah; whereas it is in proof, that the Rahabah pointed out to Carmichael and Beawes, and which accords with Edrisi's distance from Hit, is no more than 36 hours above Annah! Here are the particulars.

These gentlemen were told that, from Jub Gannam, Rahabah bore ENE.[1] (clear of variation), dis-

[1] It is to be understood that neither of these gentlemen *saw* Rahabah Malek; the line of direction alone was pointed out to them from Jub Gannam; but others have been told the same story. And it is worthy of remark, that the bearing pointed out

tant 9 hours. Mr. Irwin made 41½ hours from Jub Gannam to Annah, on a course of E. by S., and it may be clearly ascertained by this traverse, that Rahabah cannot be farther from Annah than 35½ or 36 hours (of the same scale as Mr. Carmichael's and M. Olivier's [1].) So that the Rahabah visited by Olivier is full 12 hours higher up the Euphrates, than the one pointed out to Beawes and Carmichael, and which also accords with Edrisi. (The reader is again referred to No. XI. Letters A and B.)

It was the sentiment of Schultens, in the Index to the Life of Saladin, that *one* of the Rahabahs stood on the eastern bank of the Euphrates, and midway between Karkisia and Annah. He had perused the works of all the Oriental geographers, and this opinion was doubtless formed on all the circumstances of the case.

Balbi, in 1579, saw the ruins of a city, on the eastern bank, nearly in the situation that we have assigned to Rahabah Malek, but he names it *Rorni*. He had previously passed Rahabah Meshed.

Having set forth the reasons for believing that the Rahabah of Carmichael and Edrisi is not the one seen by Olivier and others, we proceed to examine the lines of distances to it from Edrisi.

He gives (p. 199) 114 Arabic miles, equal to

to Mr. Carmichael, in 1751, was *precisely* the same as that to Mr. Beawes in 1745.

[1] Mr. Beawes was told that the distance between Annah and Rahabah was 3 journeys. Of course these cannot be *caravan* journeys, or even *ordinary* journeys, and, if true, only those of a *courier*.

120⅓ Geogr., from Hit to Rahabah Malek-ben-Tauk [1]. This line being extended towards the point assumed for Rahabah, in Mr. Carmichael's traverse, falls short of it (*i.e.* to the east) about 2½ miles only; and it is to be remarked, that Rahabah lies as nearly as possible in a direct line between Aleppo and Hit, so that the lines meet under the greatest advantages, in point of comparing them.

The reader may recollect that at Hit, (p. 34) the lines of distance (that is, Edrisi's from the side of Bagdad, and Carmichael's from that of Aleppo,) differed 3¾, Carmichael being so much to the west. Here the difference is the same way, but 2½ only.

We come now to apply the position of Rahabah, deduced from established points in the construction, to the correction of the *assumed* position of Rahabah in Mr. Carmichael's line.

Racca has been placed under the article of Ain-al-Koom, and Beled, or Old Mosul, not far to the NW. of Mosul, in the line from Aleppo to Mosul. (See p. 34, and also No. XI. Letter D., where it appears at 21 Arabic miles to the NW. by W. of Mosul, and in lat. 36° 32′ 15″.)

Edrisi gives a line (p. 202) from Beled to Karki-

[1] Through Naussa, Dassa, Dalia, &c. Edrisi has another route, branching to the left, from Dassa, through *Battan Farda*, a point in the Great Desert route, near Erzi; but, from that place, not clear enough to be well understood. It appears, however, to skirt the western bank of the Euphrates, to a point opposite to Racca. The distance given exceeds by about 20 A. miles. Possibly one of the stages marked XLII. should be XXII.!

sia, which crosses Mesopotamia, or Jezirah, nearly in the widest part. It passes through Sinjar, and its general direction is somewhat to the W. of SW. (See No. IX.) Abulfeda corroborates the statement of Edrisi, giving 3 miles less distance only, for he has 123, Edrisi, 126, Arabic miles, or respectively $130\frac{1}{4}$ and $133\frac{1}{2}$ G. miles [1].

The tables of Nasereddin and Ulegbeg give for the latitude of Karkisia *(Circesium)* 37° 20′, doubtless meant for 35° 20′; and what is worthy of remark, for Rahabah 35° 10′, (Meshed Rahabah for certain), which is just the difference pointed out on all hands, as they bear nearly N. and S. of one another.

If we intersect the parallel of 35° 20′ with the $133\frac{1}{2}$ of Edrisi, from Beled, it falls in longitude 40° 22′, which point is at $75\frac{3}{4}$ to the SE. of Racca, and $39\frac{1}{2}$ G. miles N., a very little east, from Carmichael's assumed position of Rahabah. Now Edrisi gives (p. 202) 4 journeys between Racca and Karkisia, generally taken at $76\frac{1}{4}$ G. miles [2], and between Karkisia and Rahabah, 2 journeys, or 38.

Hence, the general agreement between the dis-

[1] Edrisi, page 202:—Beled to Tal-Achair (Tel-afar) 15; Sinjar, 21; Ain-al-Gebal, 15; Seccat-al-Abbas, 21; Al Nahrain, 15; Machesin, 18; Kirkisia, 21; total 126 Arabic miles, or $133\frac{1}{2}$ Geogr.

[2] We are ignorant from what authority M. d'Anville described the course of the Euphrates, between Racca and Annah; but it looks so little like Ptolemy's map, that it may be supposed he had some authority for it. We have copied it.

tances is very remarkable, and had the result of Carmichael's traverse been adopted, it would have made little difference. But Edrisi's distances have a claim to attention, and therefore his line of $120\frac{3}{4}$ from Hit is adopted, and a compromise made between the *long* day of Tudela and the two days of Edrisi; allowing 33, instead of 38, from Karkisia. Accordingly, the intersection of these lines places Rahabah about $8\frac{1}{2}$ G. miles to the NE. of Carmichael's position of it; though no more than 2 miles are added to his distance from Aleppo. As to the distance between Racca and Karkisia, it hardly stands in need of correction; moreover, its longitudinal position is strongly corroborated by Olivier's $35\frac{1}{2}$ hours from Meshed Rahabah to Taiba, which, on 77, brings out 2·17, or thereabouts, not very different from his former rate of 2·12.

And now having completed the correction of Mr. Carmichael's line, as well as the line of Edrisi from Bagdad to Hauran, and thence to Orfah by M. Niebuhr, it will appear that the distances on the construction, through the points of Anbar, Hit, Rahabah Malek, Karkisia, and Racca, differ no more than three miles from the aggregate of Edrisi's; that is, Edrisi gives, between Bagdad and Hauran, 357 Arabic miles, equal to 378 G. miles; to which, if the 31 to Orfah, on the authority of M. Niebuhr, be added, there will be a total of 409 G. miles, and on the construction there are 406[1]. And if, on the

[1] Detail of the line of Edrisi from Bagdad to Hauran, and thence to Orfah, by M. Niebuhr:—

other hand, the line be extended from Racca to Aleppo, instead of Orfah, it will be found that it goes little more beyond the authorities, than it fell short on the other. The agreement, therefore, on all sides, is as close as can possibly fall within the contemplation of general geography.

Should any doubt arise respecting the parallel of the *southern* Rahabah, on the ground of error in Carmichael's bearing, which may have been too much to the south of east, between Ain-al-Koom and Jub Gannam, &c., we can only say, that Beawes allows

Bagdad to Anbar .	36
Hit	57
Rahabah . . .	114
Karkisia . . .	36
Racca	72
Hauran . . .	42
	357 Arabic miles, equal to 378 Geogr.
Hauran to Orfah, by Niebuhr	31
	409
On the construction	406

It ought to be stated likewise, that Isidore of Charax allows 100 schoenes between the Kabour (i.e. Karkisia) and *Seleucia*, at the Tigris, along the Euphrates. The detail is, indeed, given at 120, but measured through the different stations, the distance is 285 G. miles, within a fraction, answering to 100 schoenes. But we have detected a manifest excess of distance in the detail, between *Olabus* (Eluce) and *Æopolis*, the bitumen fountains (at *Hit*) given at 26 schoenes, or $74\frac{1}{4}$ G. miles; although it is probably not 25, coasting the Euphrates; so that *here* are upwards of 17 schoenes in excess.

E. 25 S.), when Carmichael has E. 28 S., and Irwin E. 19 S., and that the mean of three accounts gives E. 24 S. Moreover, Carmichael, Irwin, and Beawes agree very nearly on a line of about 50 hours between Ain-al-Koom and Erzi, below Rahabah; that is, respectively E. 29½ S., 26½, and 32.

We shall now perform our promise respecting the placing of Annah.

In the map of positions, No. XI. B, is given the triangle, for the position of Aboutkeir, in respect of Hit and Battan Farda, near Erzi, two of the stations of Mr. Carmichael, on the desert route, situated at the distance of 45½ caravan hours from each other, and which line constitutes the base. Its position, corrected, is E. 20½° S., 93⅓ G. miles.

The other two sides of the triangle are formed thus: Erzi, or Irsah, bore from Battan Farda, NE. 6 G. miles; and from thence, Mr. Irwin made a supposed course of E. 3° S. 21½ hours to Annah, and from Annah, E. 10° S. 14½ hours to Aboutkeir. Hence arises a line of 38½ hours from Battan Farda to Aboutkeir.

Aboutkeir is reckoned 17 hours to the northward of Hit, but circuitously, through Juba, which is 12 NW. by N. from Hit, 5 SW. by S. from Aboutkeir. Hence the *direct* distance may be taken at 13¾ or 14 hours, or in miles, about 30.

The position of Aboutkeir thus obtained, regulates, in the first instance, the parallel of Annah, and also the direction of the road from it, through Mesopotamia, to Bagdad!

It has been shewn that Annah bears W. 10 N. from Aboutkeir, distant $14\frac{1}{2}$ hours. This position also agrees with the report of its being 9 hours from Tagabjamus, a station on the desert route, $18\frac{3}{4}$ hours from Battan Farda: so that Annah falls in the parallel of 34° 18′ 45″, although given at 34° in the Tables. This position, moreover, agrees generally with Mr. Beawes's report of Annah being 3 journeys from Hit, for the construction allows $50\frac{1}{2}$ G. miles. M. Olivier was $36\frac{1}{4}$ hours, with a caravan, from Hit to Annah, which is nearly 3 hours longer than the trace through Aboutkeir. It appears that he came to the side of the Euphrates, at Nazerya (or Zawye), at about 14 hours short of Annah, although Mr. Irwin made only $14\frac{1}{2}$ to Aboutkeir, which is $2\frac{1}{2}$ further from Annah, for Mr. Irwin went with a small party, and with expedition. The proportions, therefore, will hold throughout, and the $22\frac{1}{2}$, between Hit and Nazerya, may be reckoned equal to the distance on the construction. See again No. XI. B., where A B C is the triangle formed on the whole distance of 17 hours from Hit; A B D the *corrected* triangle.

The lines of Irwin, Texeira, &c., through Mesopotamia, require no further explanation, than that given in the Diagram, No. XI. Letter E.

Mesjid Ali to Basrah:—Conclusion of Mr. Carmichael's line across the Arabian Desert, including a branch from Bagdad, through Kufa and Waset.

The present city of Basrah is situated in lat. 30° 30′, and lon. 47° 33′, according to the observations of Capt. Ritchie, in about 1780. It accordingly stands on the construction at 233 G. miles, on a general SE. bearing from Bagdad. And from Mesjid Ali, fixed as above, (p. 29) about ESE. ½ S. distant 197½. It has been remarked, that Mr. Carmichael's route between Mesjid Ali and Basrah was very circuitous, so that no useful inference can be drawn from it in respect of the proportions of road distance to the direct distance, applicable to the construction of future maps. But there are other registers of the time on the *direct* route which answer the purpose, although Mr. Carmichael's would have been more satisfactory had it gone direct. These accounts are, to Basrah,

Hunter.	Capper.	Taylor.	Mean.
102	104·20	99·10	101·50

and to Zobeir, or Old Basrah,

Hunter.	Capper.	Taylor.	Mean.
99	101·20	96·10	98·50

The direct distance between Gersemy and Zobeir[1] is 203 G. miles, but 206 through the principal

[1] Zobeir is a town on the site of the first city of Basrah, situated at 3 hours' journey to the SSW. of the present city, and on the ancient course of the Euphrates.

stations; whence the rate on the direct line will be 2·054, and on the other 2·084, per hour.

It will appear, then, that these rates differ but a *shade* from Mr. Carmichael's on the other part of the desert, his being 2·058 to the 2·054 of this part for the *direct* line, and 2·085 to the 2·084 for the more detailed line. And this is well worthy of observation; for the two parts of the line of the desert route, separated by the celestial observation at Hilla, are to be regarded as distinct examples, since the first was made by Mr. Carmichael, the other by different persons; that is, Col. Capper, Col. Taylor, Mr. Hunter, &c. So that, by great attention to the register of the time, and the general inflexions of the road, very great use may be made of the camel's rate as a scale for general geography.

Between Bagdad and Basrah the notices are very scanty, as they relate to the general construction. The distance *direct* on the map, between the two celestial observations, is 233 G. miles; but the Bagdad and Basrah of Edrisi are the *first* cities of those names; the former now removed lower down the Tigris; the latter from the eastern bank of the ancient bed of the Euphrates to the western bank of the Shat-al-Arab, or confluent stream of the Euphrates and Tigris, and some miles nearer to Bagdad: therefore the distance of those two cities, intended by Edrisi, is 240 G. miles nearly, and *through* Waset 241. The ancient Basrah is the Zobeir above recorded, 3 hours to the SW. of the present city.

Edrisi (p. 120) says that the distance is 15 days between the two cities through Waset, which is 8

from Bagdad, 7 from Basrah, and also 6 from Kufa, which is itself 5 from Bagdad, 12 from ancient Basrah. Kufa was nearly $6\frac{1}{2}$ G. miles E. northerly from Mesjid Ali, and in lat. 32° 3′, and distant from *ancient* Bagdad $80\frac{1}{2}$ G. miles; of course each day's journey must have been of 16·1. From Kufa to Old Basrah is 193 miles, whence the rate for the 12 days would be $16\frac{1}{12}$: this proportion, therefore, accords exactly with the former; and hence we are furnished with *two* distinct bases for Waset. If we take the 6 days from Kufa at $96\frac{1}{2}$, and meet this line with $112\frac{1}{2}$, the amount of the 7 days from Old Basrah, (at the same rate), the intersection falls in lat. 31° 52′, long. 46° 7′ 15″, for the position of Waset. And as the interval between this station and Old Bagdad is $128\frac{1}{2}$, it makes up just the amount of the 8 journeys at the same rate.

The agreement of this proportional scale must be allowed to be unusually close: that 5 lines of distance, amounting in the aggregate to 38 days' journey, and forming the sides of two distinct triangles, should be in such perfect harmony with each other. But the *scale* of the day's journey is different from what occurs almost every where else in Edrisi, where 19 is the common standard, and is quite unexplained. For, although some of the lines might be accounted for from the extent of the morasses in Lower Mesopotamia and Babylonia, yet this does not appear to be the state of things between Bagdad and Kufa, where we are accustomed to hear of a good straight road. What it might have been 600 or 700 years ago we know not.

Waset was a very celebrated city on the Tigris river, and commonly said to be *midway* between Bagdad and Basrah, whence its name. In the construction of the geography it is a most useful station, as it serves, in the first place, to determine the eastern limit of Lower Mesopotamia, (Jezirah,) and also as a point of outset from that quarter to Sūs, Shuster, and Shiraz; for, without such a fixed point, the distribution of the space between the Tigris, Ispahan, and Shiraz, could not have been satisfactorily accomplished.

According to the general tracing of the Tigris, collected from Mr. Irwin's journal, the point of coincidence of the lines of distance for placing Waset actually falls between Sukar and Ali-Sharree. (See Comp. Geog. No. VI.) No remains are known to be in that neighbourhood; but a town of the same name exists at present in the same general position, but situated on what is now only a *principal branch* of the Tigris, running parallel to it, at the distance of 6 or 7 miles. This we learn from Mr. Jackson, (see p. 65,) who passed by it in 1799. Such changes are very common; and it is said that the Tigris is again about to change, its branches enlarging, and the main body decreasing. A very large proportion of its waters flow into the Euphrates between Sukshu and Korna.

The latitude and longitude given for Waset in the Oriental Tables is universally 32° 20′ and 81° 30′, or 30 min. east of Bagdad; 3° 30′ west of Kaswin. It must, however, be in a much lower parallel in order to be $\frac{8}{15}$ of the way from Bagdad to Zobeir;

and the difference of long. between it and Bagdad cannot be less than $1\frac{3}{4}^0$. It agrees with Kaswin.

Waset is placed on the construction at 99, instead of $96\frac{1}{2}$ from Kufa; but the *original proportions* are preserved between Bagdad and Basrah: its longitude, so corrected, is $46^0\ 10'\ 15''$, and latitude $31^0\ 54'$, accordingly, its longitude is $7\frac{1}{4}$ min. only to the east of the Tables.

SECTION III.

Line connecting Aleppo with Hems, Damascus, and Sidon; and Damascus with Egypt.

No complete line of bearing and distance can be made out between Aleppo and Demeshk (vulg. *Damascus*) from all the geographers and travellers, collectively, that we have had an opportunity of examining. Nor is there any one celestial observation for the longitude between Aleppo and the eastern frontier of Egypt. So that there is no other way of checking the direction of the line towards Damascus, than by tracing cross lines from Racca on the one hand, and Tortosa (*Autaradus*, on the sea coast) on the other; to Hems, (or *Emesa*) about midway between Aleppo and Damascus; and from whence the chain of bearings is rather more perfect[1]. There is, indeed, a line from Rahabah to Damascus, through Palmyra; but it is of too great a length to correct

[1] This construction is explained more particularly in Map No. XI. letter A.

any errors arising on such a line, although it may be applied satisfactorily as a corroborative.

The line from Racca to Tortosa occurs in Edrisi, and is of more value from its being checked by the route of the travellers to Palmyra, formerly mentioned.

The parallel of Hems is approximated by the following authorities.

First, by the proportion of the distance between Aleppo and Damascus, calculated on a mean of the different Itineraries; and, secondly, by the Antonine Itinerary, which will be found to agree generally.

The parallel of Damascus is given at 33° 27′ 30″; and its general position understood to be S. by W. from Aleppo. This is collected, from its distance from the sea-coast, by Mr. Maundrel, &c.; taking M. d'Anville's line of the sea-coast, as we know of no other better authority. And it is necessary to assume this general position of Damascus, in the first instance, in order to form a general idea of the scale of the Itineraries.

M. Thevenot's Journal is our principal guide, having found the benefit of his itineraries from Egypt to India. But there is a chasm of about 20 hours in his line of bearings, which renders it imperfect in that respect; but which is supplied by a cross distance from Tortosa to Hamah, and by the Antonine Itinerary from Antioch to Hamah.

Thevenot's line of distance is very complete, although it cannot be employed with effect, until the bearings are known. His number of hours was

$84\frac{1}{2}$ with a caravan [1]. A second statement of the distance in the "Journey from Aleppo to Damascus" is imperfect, by the omission of $10\frac{1}{2}$ hours in different places. But as the remainder is very consistent, we supply these from Thevenot; and then have $81\frac{1}{2}$ for the result. The mean 83. Abdulkurreem, and the history of the Wahabis, 84. The interval between Aleppo and Damascus, assumed to be 166 G. miles *direct*, gives, of course, two per hour for the rate. But the road, as may be seen by the Tables, is very circuitous, particularly towards Damascus, and ap-

[1] *Aleppo to Damascus.*

Thevenot.		Journey to Damascus.	
		Hours.	Hours.
Kantoman . .	No bearings.	3	4
Serakheb . .		9	$8\frac{1}{2}$
Marra . . .		6 omission of 2 .	5
Cafetab . . .	Southward	6	7
Hamah . . .	Southward	8	$8\frac{1}{2}$
Restan . . .	S.	4	S. 4
Hems . . .		$7\frac{3}{4}$	6
Champsey, or Shemsin . .	S.	$7\frac{1}{2}$	5
Hassia . . .	*	$3\frac{1}{4}$	2
Karaw . . .	S. and SE.	8 omission of 3 .	8
Nebk . . .	S.	3	2
Coteifa . .	SW.	$10\frac{1}{2}$ omission of $5\frac{1}{2}$	5
Essdir . . .	W.	$5\frac{1}{2}$	SW.
Damascus . .		3	9
		$84\frac{1}{2}$	

* Pococke reports this to be south-easterly.

pears to add seven miles to the 166, whence 173 must be taken for the number, on which the real rate must be calculated; giving a new rate of 2·119, or very nearly that of the Great Desert by the trace of the road [1]. We have followed M. Thevenot's statement of course.

Hems is 43¾ hours from Aleppo; 40¾ from Damascus; and if these proportions are laid off on the *trace of the* road, (*i. e.* following the general inflexions), according to the table, Hems would fall in lat. 34° 43′ 30″.

The Antonine Itinerary has 133 MP. between *Antioch* and *Emesa*, equal to about 95 G. miles direct. This line of distance on a SSE. course nearly, (as the distances of Hamah and Hems from the coast imply), allows 34° 40′ 30″, or three less than the former. The latitude of Hems in the Oriental Tables is not conclusive. Some confound Hamah and Hems together. Yacutus has 34° 40′; Abulfeda, 34° 20′. But here it must be noted, that he is generally 20 min. too far south in his Syrian latitudes. Thus, Aleppo is in 35° 50′, which should be 36° 11′; Antioch much the same. Hems 34° 20′ for 34° 40′ or 43′; Scanderoone 36° 10′ for 36° 35′ 30″. Damascus and some few others are very near the truth.

Having thus *approximated* the parallel of Hems, it will be proper to examine the cross lines of dis-

[1] Meaning through the principal points of the route; not the *road* distance.—The rate, on 96 hours on the Arabian desert, was 2·143; and on 200 hours somewhat under 2·1.

tance in order to ascertain the bearing from Aleppo, &c.

The first will be that from the sea-coast at Tortosa. In order to which the tour of Latikeah must be made. This place *(Laodicea ad Mare)* is given by M. Niebuhr, at 84 G. miles *direct* from Aleppo to the SW. by W.; and its latitude, by the same authority, 35° 31′. As this gentleman's computed distances were found 2 in 27 in excess in Mesopotamia, &c., the correction will reduce it to about 78. The road is difficult, and the calculation of the direct distance subject to error. Mr. Eyles Irwin, who was so eminently successful in estimating the distances across the desert, (having calculated that from Aleppo to Bagdad at 493 British miles by the road, and it actually appears to be about 480), computes the road distance at 106 B. miles. Mr. Drummond, whose distances are often over-rated, allows 110; and Mr. Ives 102. So that Mr. Irwin's is an *exact mean* between the others. Allowing the error of Mr. Irwin's calculation on the desert, which is scarcely $2\frac{3}{4}$ in 100, the result will be 79 G. miles direct; differing from M. Niebuhr's only one mile. The mean $78\frac{1}{2}$, laid off from Aleppo, to the parallel of 35° 31′, places Latikeah in longitude 35° 46′, or 1° 23′ west of Aleppo.

The only authority for the longitude of Latikeah is that of a time-keeper observation in Don Galiano's chart of the Mediterranean. It is there given at 42° 1′ 30″ east of Cadiz; 4 min. W. of Ras Kanzir, which, on our construction, is in 35° 46′ 30″. Hence, Latikeah would fall in 35° 42′ 30″; or only $3\frac{1}{2}$ min.

different from our position. But it is to be remarked, that he places Tripoly under the same meridian with Latikeah!

There is, indeed, so great a deficiency of observations for the longitude along the whole coast of Syria and Egypt, until we arrive at the mouths of the Nile, that we have been compelled to take M. D'Anville's *general* bearing the whole way to Gaza[1].

Proceeding southward from Latikeah 39 G. miles, we come to Tortosa and the island of Ruad (*Aradus* and *Antaradus*). The learned travellers, Pococke, Shaw, and Maundrell, were not aware that a better knowledge of its bearings from Latikeah would have prevented much doubt and trouble. And the bearing might easily have been taken, as from the castle of Latikeah the island of Ruad is said to be visible.

M. D'Anville, in different publications, has allowed 6 miles, and 13 miles, of easting, between Latikeah and Tortosa, which certainly proves a doubt, as the difference makes about 10° difference in bearing. It appears to be a generally received opinion that the bearing is to the E. of S. Shaw has S. by E. in his map, S. by W. in his book; nor is it the only occasion on which they disagree. If he made the map himself, one would follow that in preference, as construction implies *proof*, and is not subject to errors like the press. We have taken it at 9½ of easting, whence the bearing will be S. 15 E. the lat. of Tortosa 44° 54′ and long. 35° 57′ 30″.

[1] M. Niebuhr thought D'Anville's latitudes pretty exact along this coast.

Having placed Tortosa, we turn eastward to Hems and to Hamah, and through them, respectively, to Resafa and Racca.

Edrisi (page 118) allows two journeys between Antarsus (Tortosa) and Hems, or 38 G. miles. These, laid off to the parallel assumed for Hems, 34° 43′ 30″, leave an interval of 123 between it and Resafa, which Edrisi (p. 197) gives at 120¾, as follows:

Hems to Salamiah, 24; Castel, 30; Maragha, 36; Resafa, 24: total, 114 Arab. miles, or 120¾ Geogr. So that the interval exceeds by 2¼; but then it is to be understood, that Salamiah lies a little out of the line (to the southward), and thereby increases the distance to 124¾, or 4 in excess. But this must be allowed to be a trifling difference in the closing of such long and circuitous lines of distance.

Before we proceed finally to fix the position of Hems, it will be proper to enquire into that of Hamah, which depends also on Tortosa, as well as Hems.

Dr. Shaw says that Hamah is 10 leagues inland from Tortosa; and it appears by another passage in his book, that those of 3 G. miles are intended. But his map has 35. For the reason stated above, probably the map ought to have the preference. Now, if we make a triangle of Tortosa, Hamah, and Hems, the base being the two days between Tortosa and Hems, and the parallels of these two places 34° 54′ and 34° 43′ 30″, regulating the direction of it (which will be about E. 14 S.), we shall have 35 G. miles for the side between Tortosa and Hamah; and

by the table of distances, at page 61, the mean distance between Hamah and Hems being nearly 11 hours, about 23 G. miles may be taken for that side, and Hamah will bear about N. 10 W. from Hems. Thevenot says *northwards;* and it is highly probable, from the *data,* that it should be to the W. of north.

Hems at two journeys from Tortosa, and in the parallel assumed, is 91 G. miles from Antioch. The Antonine Itinerary has 133 equal to 95 G. miles, or 4 more than the construction; and of these, 32, equal to nearly 23 G. miles, are between Hamah and Hems, *(Epiphania* and *Emesa)* agreeing precisely with the modern distance.

Having placed Hamah and Hems, the next step will be to place Salamiah, which, as was observed, lies out of the line to Resafa, as is proved by what follows. Golius says that it is two journeys from Hamah on the road to Palmyra; and Edrisi, that it is 24 A. miles ($25\frac{1}{2}$ G. miles) from Hems. These lines place it, accordingly, to the SE. of the line to Resafa.

The English travellers who visited Palmyra in 1678, came to a well named Costal, at 27 hours from Aleppo, in the direction of S. 25° E., by compass; or true, S. $30\frac{1}{2}^{0}$ E. distant 72 G. miles; and as both the name and general situation accord so well with Edrisi's Castel, it can scarce be doubted but that it is the same place. And if this be admitted, it serves most admirably to check the lines of direction, as well on the Damascus, as on the Palmyra road. For it differs no more than $3\frac{1}{2}$ degrees in bearing,

being about S. 27 E. from Aleppo; that is, it places Costal about four miles more to the east than Edrisi's line from Resafa. However, we have preferred the cross line of distance to a bearing of so dubious a kind, as *such a one* must be, under any circumstances.

To return finally to Hems. It appears in page 65, that Edrisi's line from Tortosa to Resafa, fell short by 4 German miles of the interval on the construction; and these 4 miles are disposed of, by adding one of them to the line from Resafa; 3 to that from Tortosa; for as the distance on the first is *specified* in miles, it was judged best not to alter *that* in any considerable degree: but as days' journeys vary; and go sometimes so high as 24 Arabic miles, the other 3 miles are added to the 30 on that line; still making the journey no more than $20\frac{1}{2}$. And hence it became necessary, in order to preserve the relative positions, to increase the distance of Hamah from Tortosa: and, accordingly, one mile is added to Dr. Shaw's 35. It then bears from Hems N. 15 W. or nearly in the line of the Roman road to Antioch, as it ought.

Pursuing the line from Aleppo towards Damascus, the materials are not of a kind to depend on without the aid of cross lines from given points. For the great road is very circuitous from Hems, southward, perhaps to avoid the more rugged parts of *Anti-Libanus*, which crosses the road, and extends into the Desert, eastward to Palmyra, &c.; but diminishing in height as it advances.

The cross lines can only be obtained from certain positions on the coast, and there is no other known authority for this coast superior to M. D'Anville's; which we have accordingly adopted, but with a very trifling alteration. For it appeared on a comparison of the position of Gaza, with the reputed distance of that place from Salahieh and *Pelusium*, according to the French observations, that M. D'Anville's bearing places Gaza too far to the east. Here, again, the authorities are not correct enough to warrant so great an alteration as is suspected, although a part cannot be dispensed with: for though the authorities are not correct, they contain a kind of internal evidence in proof of an error in the existing maps. The suspicion extends to 8 or 9 G. miles; but we have only made an alteration of 3, leaving the greater supposed error to the correction of future geographers, when the longitudes of the places along the coast of Syria, &c. shall be fixed by celestial observations.

Our correction produces a change of *one* degree of bearing only, more to the *west* of *south*. The 8 or 9 miles, about 3° or more.

It has been already remarked, that there is no observation of longitude any where between Aleppo and Egypt; not even at Jerusalem; for the longitude of that city, recorded in the *Con. des Temps*, is not given on any very good authority. So that there is, in fact, an interval of more than $4\frac{1}{2}$ degrees of longitude without an observation; and where it is most wanted.

It is true, however, that the longitude given for

Jerusalem, 35° 20′ E. from Greenwich, agrees, within a few minutes, with the general construction; but there is no certainty in the case. Here follow the authorities, such as they are, for the extent of the space between the eastern border of Egypt and Gaza, in Syria. It should be remarked, that the most easterly of the French observations, *inland*, is at Salahiah; on the coast the longitude is extended by admeasurement to the site of ancient *Pelusium*. Salahiah is in 32° 0′ 30″; *Pelusium*, 32° 33′. M. D'Anville, who, no doubt, had well considered this matter, allows 2° 19′ difference of long. between Salahiah and Gaza; 2° 1′ between Pelusium and Gaza; but it is to be noted, that he supposed Kahira (vulg. *Cairo*) to be 9 min. more to the east (on the faith of former observations) than the present fix it at.

Captain Leake (of his Majesty's Royal Artillery) allows 40 *leagues* between Salahiah and Al Arish; from whence the distance to Gaza (about 35 G. miles) is much better known than the other. These leagues he estimates at a higher scale than French leagues; perhaps at $3\frac{1}{4}$ B. miles each by the road, that is, altogether, 130 road miles. If from these $\frac{1}{15}$ part is deducted for the inflexions across the Desert, there remain $121\frac{1}{2}$ British miles in direct distance, or 105 Geogr. between Salahiah and Al Arish.

General Regnier, in his map, allows about 98.

Paultre, in his map, (a compilation,) has 117.

M. Thevenot reckoned $56\frac{1}{2}$ hours with a caravan. A great part of the way is through a loose, deep, sandy desert; the rate, therefore, uncertain. At

2 *per* hour it would give 113 G. miles; but the result is too uncertain for use, but probably much under 2 *per* hour.

The Antonine Itinerary has 92 MP. between Pelusium and *Rhinocorura* (taken for Al Arish,) equal to 70 G. miles (with an allowance of $\frac{1}{15}$ for winding). This falls short of Captain Leake's, allowing for the different points of outset, by 5 miles. The mean of these distances would be $106\frac{1}{2}$ from Salahiah to Al Arish, agreeing very nearly with Captain Leake's report.

Here follows a statement of the distance between Al Arish and Gaza: the former line was nearly straight, and in an E. by N. direction nearly; the present one is NE. and forms a curve along an embayment of the coast.

Captain Leake reports $11\frac{1}{2}$ hours of *camel* travelling between Al Arish and Kan Younes, (*Jenysus* of Herodotus,) taken at 24 G. miles direct; and thence to Gaza, 4 hours of *ordinary* travelling, taken at 11; total 35 G. miles, allowing for the loss by the curvature of the coast.

Thevenot has $22\frac{3}{4}$ hours within this space, which appears to be a mistake. Taking, then, the two reports of Captain Leake, of 105, to Al Arish, and thence 35 to Gaza, it would appear that the shortest line that can be drawn between Salahiah and Gaza, *through* Al Arish, is 140 G. miles; and which, by allowing for the angle at Al Arish, may produce $135\frac{1}{2}$ on a direct line, between the latitudes of 30° 48′ 30″ and 31° 26′ 45″, those of Salahiah and Gaza respectively. This gives a difference of longitude

of 2° 32′ 30″, which, added to that of Salahiah, 32° 0′ 30″, gives for that of Gaza 34° 33′; whilst that deduced from M. D'Anville's position of Tripoli, is 34° 36′ 30″, or $3\frac{1}{2}$ min. more to the east.

There are two other statements, which fall short by 8 miles and upwards; one is from Captain Leake, who says, that the usual computation of the length of the way between Salahiah and Kan Younes is 150 British miles, and 13 thence to Gaza, in all 163. If $\frac{1}{15}$ be deducted for winding, as in the former cases, there remain 152 B. miles, equal to $131\frac{1}{4}$ G. miles; of course $8\frac{3}{4}$ less than the former.

The other is the Antonine Itinerary, which has 136 M.P. between *Pelusium* and Gaza, equal to 102 (with $\frac{1}{15}$ for winding). And this distance will fall short of Captain Leake's own report (105 from Salahiah) by 8 miles.

M. D'Anville supposed that the difference of long. between *Pelusium* and *Gaza* was 2° 4′ 30″, and by the present construction it is just 2°; but he shortened that between Salahiah and Gaza by 17 minutes. It appears, however, that we agree within $4\frac{1}{2}$ miles in the length of the sea-coast between Egypt and Syria.

We have adopted the distance pointed out by Captain Leake, by which Gaza is placed in 34° 33′ long. or $3\frac{1}{2}$ min. to the west of M. D'Anville's. Jaffa and Jerusalem will follow the same rule, which leaves M. D'Anville's elegant and admirable maps of Phœnicia and Palestine [1] entire every where to the

[1] Some lines of distance are traced over the map of Palestine and Phœnicia, No. XI., with a view to ascertain the general

south of a line drawn from Tripoli through Balbek to Damascus, the valley of Bokah *(Cœle Syria* proper) only excepted; and the form and extent of this valley has been altered on the authority of notices found in Messrs. Wood, Maundrell, Pococke, and Thevenot. Accordingly, the positions on the coast, Tripoli, Beirut, Saide, &c. preserve their situations, with the alteration of 1° in bearing more to the *west* of *south.*

Having now said what appeared necessary to explain the position of the line along the sea-coast, which is to furnish fixed stations for laying off lines of distance towards the interior, we shall mention what particular positions they occupy on the construction. The reader is requested to refer, for particular explanation, to No. XI., and for a general view of the whole, to No. IX.

Tripoli, or Tarablos, is one of the principal cities now in existence on the coast of Syria. In M. D'Anville's map it bears about S. 30° W. from Tortosa, distant 31 G. miles; its lat. 34° 28′, and long., on the construction, 35° 37′.

Beirut *(Berytus)* is another station on the coast, lat. 33° 46′ 30″, long. 35° 30′, 42 miles S. a little W. from *Tripoli.* From these two stations the lines that are to determine Balbek, and finally Damascus, originate.

truth of the scale; as, 1. Maundrell's route from Sidon to Jerusalem; 2. Hajy Kalifa's from Damascus to Jerusalem; 3. Yaffa to Jerusalem, Mr. Spiller; 4. from Tyre to Tabaria; 5. Thevenot's from Damascus to Baneas, &c. &c.; all of which appear to be consistent with M. D'Anville's construction.

Seida, Saide, or *Sidon*, of ancient celebrity, follows, at 22 miles to the SW. of Beirut, lat. 33° 27′, long. 35° 17′ 15″. From this place Mr. Maundrell has an important line of distance to Damascus. There is also another to it from Beirut, and a third from *Tyre*, or Sûr, whose lat. is 33° 11′ 40″, long. 35° 11′, and about 17 miles to the SSW. of Seida.

Akka, or *Ptolemais*, succeeds, at 24 miles from Tyre, a place no less celebrated in ancient history, and in that of the middle ages, by Richard *Cœur de Lion*, than by our illustrious countryman, Sir Sidney Smith, in modern times: the lat. of this place is 32° 48′, long. 35° 3′ 20″.

Yaffa or Jaffa, *(Joppa)*, is the last station that shall be mentioned in this place. It is reckoned the port of Jerusalem, from whence that holy and celebrated city is distant 15 hours to the SE. by E. The parallel of Yaffa is 32° 1′ 30″, long. 34° 43′ 30″, and it is 51 miles to the SSW. of Akka, 35 N. by E. from Gaza, the last city on the coast of Syria towards Egypt.

After so long a departure from the line from Aleppo to Damascus, and so wide a circuit, in order the better to effect the purpose, we now return more immediately to it, by establishing the position of Balbek, as preparatory to the other.

Balbek, *(Heliopolis)*, well known in modern times by Mr. Wood's exposition of its magnificent remains, is situated to the SE. of Tripoli, NE. of Beirut, and in the valley of Bokah, between the ridges of *Libanus* and *Anti-Libanus*.

The road between Tripoli and Balbek has been reported by several persons of repute and accuracy, amongst others, Messrs. Wood and Maundrell.

It is generally reported that Balbek bears SE. from Tripoli, and the distance 16 hours: the vast ridge of Libanus is crossed almost at its most elevated part, and the breadth of its base constitutes a large proportion of the way; yet it is not rugged, so that the distance, direct, may be taken at 38 G. miles, or more, for Mr. Wood allows 16 hours, and was not a slow traveller.

From Beirut it is 36 A. miles, according to Hajy Kalifa, or 38 G. miles; from Hems, according to M. Roque, it is $25\frac{1}{2}$ hours: his rate was slow between Hems and Hamah, where he reckons $12\frac{1}{2}$ hours, and the distance no more than 23 G. miles; at this rate Balbek would be only 47 from Hems. But Roque has another statement; he says that the source of the Asi river *(Orontes)* is 8 hours, or one journey to the NE. of Balbek, (which is allowed on all hands,) and that Hems is 12 *(French)* leagues from that source. From this account, if French leagues, 47 to 48 would also arise; but it is not certain, and the hours are the best guide; and for these one might surely reckon 51 miles, on such smooth ground, for it is either a valley or plain the whole way. Mr. Vaughan travelled it in $16\frac{1}{3}$ hours, but he travelled very rapidly for that country [1]. Mr. Wood's line from

[1] Mr. Vaughan went from Nasebin to Mosul in $34\frac{3}{4}$ hours, which is seldom done in less than 46 or 47. Mr. Otter, indeed, went in $42\frac{1}{2}$.

Karaw to Balbek will justify the distance of 50 or 51 miles.

The intersection of these three lines of distance, from Tripoli, Beirut, and Hems, will place Balbek in the general position of 34° 1′ 30″ lat., 36° 11′ long.; and its distance from the above three places, respectively, 38¾, 37½, and 50½ G. miles S. 35 W.

Nothing would be more easy than to fix all the inland positions in Syria by the bearings of the loftiest summits. The coast lying so near the meridian, the difference of latitude would serve for a succession of bases; for the most prominent points of the chain of Lebanon, &c.; and the high Lebanon is visible from Palmyra, as Mr. Wood informs us.

Karaw has been mentioned, in page 61, as a geographical station. This is a town on the road from Hems to Damascus, just midway. Mr. Wood's party were 12½ hours between Karaw and Balbek; first, 7 hours west a *little* south, to Ersale; and thence, *more to the south*, 5½ hours, to Balbek. The whole course may probably be taken at W. by S. to W. ½ S. They appear to have allowed the variation in all cases. As to the rate, they were merely a party of horsemen, and disencumbered of their beasts of burthen, and even of their guard: therefore 2⅔ or 2¾ may be taken, and the whole distance 34½, on a course of W. 6° S. It may be remarked, in justice to Dr. Pococke, that he reckons this distance 32 miles on a course of W. 18 S., which, considering that he did not travel this road, shews that he was accurate in guessing and approximating.

Karaw is 18 or 19 hours to the S. by E. of Hems,

(and is the *Ocurara* of the T. Tables). Hassia, a place made remarkable by Mr. Wood's visiting it repeatedly, and by the assistance afforded by its chief to that gentleman, on his expedition to Palmyra and on his return, lies between, at the distance of $10\frac{1}{2}$ hours from Hems. It is proper to note the position of this place also, as it is the point of outset of Mr. Wood for Palmyra.

Karaw is taken at $39\frac{1}{4}$ G. miles from Hems, which, meeting the line of $34\frac{1}{2}$ from Balbek, places Karaw S. by E. from Hems; and Hassia, accordingly, will take its position in lat. 34° 22′, long. 36° 52′, or $22\frac{1}{2}$ G. miles S. 9° E. from Hems. Pococke has it at S. 8 E. 21 in his map.

From Karaw to Damascus, 22 hours, the road takes a very deep bend to the east; to Nebk S. 3 hours; Coteifa, SW. $10\frac{1}{2}$, Damascus $8\frac{1}{2}$ SW. and WSW. By a comparison of the different journals, and supplying the deficiency of one from the matter of others, it appears, that the general bearing between Karaw and Damascus may be taken at between SSW. and SW. But as there are lines of distance to Damascus from Balbek and Saide, from the best authorities, it will be best to have recourse to them in the first instance.

Balbek is said to bear NNW. from Damascus by Mr. Maundrell; N. 25 W. by Dr. Pococke's map. The distance by Mr. Wood is 16 hours; by Maundrell $16\frac{3}{4}$; Pococke, with a caravan, 18 hours; Abulfeda and Edrisi allow 2 days; Mr. Vaughan was 16 hours.

Hence, $16\frac{1}{4}$ hours appears to be the mean time

by ordinary travelling, 18 by caravan. Accordingly, as the road leads along or over the skirts of *Anti-Libanus*, $2\frac{1}{4}$ seems a sufficient rate for the ordinary travelling, and 2 for the caravan, or 36 G. miles. The two journeys would be 38 strictly.

On the other hand, Mr. Maundrell was $24\frac{1}{3}$ hours from Saide to Damascus, the road crossing *Libanus* and *Anti-Libanus*. His rate along the coast of Syria, where the distance is well known by the difference of latitude, was found to be $2\frac{1}{3}$ (or 2·38) on $44\frac{1}{2}$ hours between Latikeah and Beirut, which is 106 G. miles; and from Latikeah to Jerusalem, $95\frac{1}{2}$ hours, 224 miles, equal to 2·345. Hence, if it be conceded that the two ridges of mountains opposed an obstacle equal to that formed by the indentations of the coast, in respect of the progress, the $24\frac{1}{3}$ hours would give $56\frac{3}{4}$ for the distance of Damascus from Saide; and M. D'Anville allows the same.

The intersection of these lines places Damascus (whose parallel is taken at 33° 27′ 30″) in long. 36° 25′, or 44 min. west of Aleppo. M. D'Anville places it in 36° 29′, or 4 min. more to the east. But if it be considered that his result is deduced from Jerusalem on the south (in 35° 20′), and ours from Aleppo on the north, it is in fact a near agreement. It has been already noticed, that on the construction, we have removed the position of Gaza and Jerusalem, as well as the whole mass of M. D'Anville's geography of Palestine, $3\frac{1}{2}$ min. more to the west; this position also will be in harmony with it within a fraction of a mile.

Damascus having assumed this position, it will

appear that it must bear from Karaw S. 31 W., 43½ G. miles.

There are two other lines to Damascus from Beirut and Tyre, but in whole days, and extremely vague.

Abulfeda gives a line from Rahabah to Damascus, *through* Palmyra, which lies somewhat wide of the direct line, so as to occasion an excess of 2½ miles. The number of Arabic miles given is 197, but the construction has 203, through Palmyra, or 6 more than Abulfeda allows. It may be remarked, that if the upper Rahabah, or Rahabah Meshed, be the point intended, it would increase the interval yet 9 miles more.

Thus we have completed the line from Aleppo to Damascus, and from thence, through Saide, or Sidon, to the French observations, on the eastern border of Egypt. As Palestine is copied from M. D'Anville, as well as the southern part of Phœnicia, it is unnecessary to enter into any further explanation concerning them, than the detailed map of positions, No. XI., will furnish on inspection. We have there introduced a great number of lines of distance from the Oriental geographers, and from some of the celebrated modern travellers; all affording general testimony to the fidelity of M. D'Anville's work, and at the same time a general defence of our own conduct, in adopting the work of such a master. The ancient Roman roads are also described on this map of positions.

It remains that some remarks should be made on the difference between the former and the present map of Syria.

M. D'Anville has increased the breadth of Syria, beyond its proper limits, no less than 20 G. miles, in the parallel of Hamah, and 32 in that of Hems. What appears remarkable is, that Pococke actually gives the just breadth of the country, when M. D'Anville erred 20 miles in 55! Again, Pococke gives 58½ between Hassia and Tripoli, where we have 60, but M. D'Anville 80.

But M. D'Anville's errors do not extend into Palestine, otherwise than as his authorities increased the length of the distances across the country; for it appears by the late tour of Dr. Seetzen, in Syria and part of Palestine, that the breadth of Palestine is too great between the coast and Ain-Zerka [1].

Extension of the line from Salaheh to Kahira, Alexandria, and Siwah, (or Oasis of Ammon.)

THE points of Salaheh, Om Farege, Belbeis, Kahira, Damiat, Suez, and Alexandria, being determined, in parallel and in longitude, by the late French obser-

[1] M. D'Anville has a direct line of distance from *Ascalon*, through Jerusalem, to *Ammon*, or Ain-Zerka; so that if this line be true, the breadth of the *whole tract* is ascertained; but the line is rather too oblique.

It is proper to mention, that Ain-Zerka ought to be placed more to the south, in respect of Damascus, by 3 or more miles; but it was too small a difference to authorize a change of M. D'Anville's whole context in that quarter.

vations [1], the skeleton of the map of Lower Egypt, generally, is taken from a map of that country, formed by Captain de Haviland, of the Madras engineers. The western part of it is understood to be the work of the English engineers, the eastern of the French; and it is, in effect, a very fine piece of geography, and now deposited at the East India House. In this map, the lakes of Mareotis, Mahadi, Etko, and Butos, are described with more detail and apparent exactness than in any other that has yet appeared.

It may be proper to mention, that Mr. de Haviland made use of the French observations, for the longitude, every where but at Reschid (Rosetta), which place is laid down by land survey from Alexandria, and differs from the French observations $4\frac{3}{4}$ minutes; the observation being 30° 31′ 30″, and Haviland's position is 30° 26′ 45″.

[1] List of celestial observations taken in Lower Egypt by the French, during their sojourn there :—

	Lat.	Long. Greenwich.
Alexandria	31° 13′	29° 55′
Kahira (Cairo)	30° 3′ 20″	30° 18′
Damiat	31° 25′ 43″	31° 49′ 15″
Salaheh	30° 48′ 28″	31° 59′ 30″
Balbeis	31° 33′ 36″	30° 25′ 36″
Abousheid *	30° 32′	31° 52′
Debeh mouth	31° 32′	32° 7′ 15″
Om Farege mouth	31° 9′	32° 30′
Suez †	29° 59′	32° 35′

* This observation is quite *at variance* with the geography; † and this *doubtful.*

Siwah, or Ammon.

This is placed agreeably to the journals of Mr. Browne and M. Hornemann, and by the latitude taken by the former, 29° 12′; longitude, by distance from Kahira, 26° 24′.

On the sea-coast, *Parætonium*, or Baretoun, is placed according to M. D'Anville's distance from Alexandria, and from which neighbourhood the road strikes off from the sea-coast, joining the Kahira road, at Al Soghier, or Umme Sogier. For other particulars relating to the detail of this construction, the reader is referred to the Geographical System of Herodotus, and to the Journal of M. Hornemann's Travels.

Suez, as we have remarked, is in long. 32° 35′, by the French observations, lat. 29° 59′; but by our countryman, Mr. White, it is no more than 32° 28′ long.

According to the French observation, by which the difference of long. from Kahira is 1° 17′ east, the distance in geographical miles should be 66¾.

The march of the Indian army, on its return from Egypt, in 1802, was measured by Captain de Haviland, from Alexandria to Suez, by a perambulator. It appears that between the lake of the Pilgrims, at N. 33½ E. 9 G. miles from Kahira[1], they measured 71 miles, 3 furlongs, to the gate of Suez, or nearly

[1] This bearing is N. 27 E. 9 miles in Haviland. Paultre has NE. 11 miles.

61¾ G. miles. But the space on the construction, formed on the French observations, is 63, (and between Kahira and Suez, 66½,) which is *more* than the *road distance,* had it been *perfectly straight!* And if winding, in the proportion of 1 in 16½, be allowed as between Terraneh and the lake, in the former part of the march, the direct distance will be 57½ only, and is indeed exactly what Captain de Haviland's map has. Is then the perambulator faulty, or the French observation?

Other accounts are 29 and 30 hours from the Birket, or lake, to Suez; Dr. Shaw, in particular, has 30. If the highest be taken, 30 hours, at the Great Desert route of 2·115, the amount is no more than 63½ G. miles direct, and the observations require 66½ or ¾.

Paultre's map has 60 only from the lake to Suez, 67 from Kahira to Suez; agreeing nearly with the observations. Since the camel rate and time gives a shorter distance than the observation, and in a great number of instances; we cannot help suspecting that the observation is too far to the east. Mr. White, in 1795, had two observations of the first satellite of Jupiter, at Suez, by which he made it 32° 28′ 30″, and by a mean of 76 observations of dist. moon and stars, 32° 28′.

SECTION IV.

Connection of Suez with Ailah, or Akkaba; and of Ailah with Damascus.

The connection of Suez with Ailah is by the circuitous route of the shore of the Red Sea (or Gulf of Suez) to Toor, and thence through Mount Sinai to the head of the Gulf of Ailah, or Akkaba. We are, however, mortified to be compelled to state, that for some cause, not understood, this position of Ailah cannot be adjusted, in point of longitude, to our satisfaction, the authorities disagreeing widely in respect of one another.

Toor, according to Sir Home Popham, lies S. 32° E., 121 G. miles from Suez; its latitude is given from 28° 12′ to 15′; and we have placed it in 28° 15′; long. 33° 41′ 30″.

From this point, Mount Sinai (that is, St. Catherine's Mount, the southernmost of the two, the other being named Mount Horeb,) bears E. 40 N. 27 G. miles, according to M. Niebuhr. The convent of St. Catherine lies N ½ W. from the summit of the mountain, distant 4 miles.

M. Niebuhr, in his map of this quarter, allows 115 G. miles between Suez and the convent, and according to the construction, formed as above, it is 113½; St. Catherine's Mount being in latitude 28° 34′, distant from Suez 116 G. miles, on a bearing of S.-42° E. See No. IX., in a separate compartment to the left.

From the summit of this mountain, Mr. Browne saw the termination, or what appeared to him to be such, of the eastern Gulf of the Red Sea, or Gulf of Akkaba and Ailah. It bore N. 42 E., cleared of variation. The distance he could not ascertain; but by the latitude of Ailah, which is taken at 29° 13′, it could not be less than 55 miles. A port named Dahab, or Indahab, taken for Eziongaber, is said to be 2 days' journey from the convent, and must be short of the head of the gulf 13 or more miles.

In order to compare the length of the line between Ajerud (or Suez) and Ailah, with the scale of the pilgrims' rate towards Mecca, it will be necessary to ascertain the rate, in the first instance, by that portion of it, between Ailah and Yambo, the part best known; as also the rate between Syria and Medina, in order to be able to judge of the consistency of the results, by a comparison of them with each other.

The parallel of Ailah is first to be ascertained, or approximated, that the obliquity of the course from Suez may be determined, and the distance of course regulated. In this operation, the reported distance of Ailah, from the side of Damascus, by modern accounts, and from that of Jerusalem, must be attended to.

The parallel of Ailah is thus reported:—

By Ptolemy	29° 15′	Mean 29° 2′.
Abulfeda	29°	
And	28° 50′	
By the Theod. Tables, MP. 219 from Jerusalem, equal to 156½ .	29° 13′	Mean 29° 9′.
By Abulfeda, 15 days from Damascus	29° 5′	

And as Dahab is 2 journeys to the NE. of St. Catherine's convent, and also a considerable distance *short* of Ailah, we take 29° 13′. The 151 MP. of Marcian from Gaza, equal to 112 G. miles, reach no farther than to the parallel of 29° 35′, and the 1260 stadia of Strabo, even if Roman stades, reach only to 29° 22′.

We come next to the enquiry into the rate of the Mecca caravans, from Egypt and Syria. We have four examples of this route,—two from each country. The agreement will be found to be very near indeed between three of them; that is, not more than $2\frac{1}{4}$ on 100 miles between the highest and the lowest; but the rate is much lower than on the Desert, between Aleppo and Basrah; the one being 2·058[1], the other, on the mean of the *three* just mentioned, 1·96; differing in the proportion of about a twentieth part, and this is to be attributed to the greatness of the caravan: for the Mecca caravan is said to consist occasionally of 15,000 camels; the Basrah and Aleppo caravans of 1000 to 2000. Moreover, the stages to Mecca are of unusual length.

The two reports from Egypt are from Thevenot and Pococke; those from Syria, from Abdulkurreem and Mustapha; the first from a printed memoir of Mr. Gladwin's; the other from my friend Mr. Charles Vaughan.

Dr. Pococke's account is 3170 *derais*, of 4

[1] The line from Aleppo to Basrah is nearly of the same length as that from Damascus to Medina; that is, somewhat more than 620 G. miles. So that, in respect of distance, the comparison is fairly made.

minutes each, or 211⅓ hours, from Ailah to Yambo; which, allowing the one to be in 29° 13′, the other in 24° 5′, measures, by the general trace of the coast, 389 G. miles, and consequently gives a rate of 1·841 per hour.

M. Thevenot has only 200½ hours, over the same ground, or nearly 11 less than the former, and the rate proportionably greater; that is, 1·94.

Of the routes from Syria to Medina, that by Abdulkurreem has 318 hours; that by Mustapha, 314[1]; and which differ no more than a 77th part. But although the general result came so near, the intervals frequently differed considerably. As the Journal of Mustapha, who had crossed the Desert several times, was communicated by Mustapha himself to Mr. Vaughan, in Arabic, one is apt to place more dependence on that than on a MS. that had been often copied, and passed through a great many hands!

The distance from Damascus to Medina, through Maan and Tebouk, is 622¼ G. miles, giving

For the rate of Abdulkurreem	1·982	
And for that of Mustapha .	1·956	
Mean	1·969	General mean 1·959.
Thevenot's on the other road	1·940	
But Pococke's	1·841	

The agreement of Thevenot's with the two Syrian caravans occasions a suspicion that Pococke's time is faulty. The difference is too great to happen on the

[1] The History of the Wahabis (since come to hand) has 321. Mean of the three 317⅔.

same kind of service, and in the same country. Accordingly, 1·96 may be taken for the rate of the Mecca caravan, over the Arabian Desert.

It may here be remarked, that the parallel of Ailah receives confirmation from the rate just mentioned; for if Ailah be 200 hours to the northward of Yambo, and the difference between the highest and lowest rate on this Desert be no more than ·042 per hour, then Ailah could not be more than 8 minutes *above* or *below* the parallel assigned.

But if we apply this scale to the distance between Ajerud and Ailah, it differs from the other authorities in a remarkable manner.

It has been stated, that from Mount Sinai the head of the gulf was supposed to be seen, and probably was so. Then the position of Ailah, at the head of that gulf, is 136 G. miles from Ajerud, on a bearing of about ESE. But Pococke's 79⅓ hours give 146, and Thevenot's 77½, 150¼; each taken at their respective rates. Here is a difference of 10 miles on the lowest calculation; 14¼ on the highest!

Dr. Shaw reports 70 hours, but whether of the caravan or otherwise, we know not. If of the ordinary camel rate, they might give 147; if of the caravan, 137 only. In another place, he says 46 leagues; and as he intends leagues of 3 Geogr. miles, in one part of his book, these must of course be taken at 138 G. miles; but on his map we measure 133 only; it would seem, therefore, as if he intended some number between 133 and 140; but these accounts differ most widely from the 77 and 79 hours of Pococke and Thevenot!

The ancient notices are the Theod. Tables, which have 170 MP. between *Clysma* and *Elana, (Clysma* is taken for Kolzūm, or Suez.) These are equal to $121\frac{1}{2}$, and Ajerud may be 7 more to the NW.; in all $128\frac{1}{2}$.

Ptolemy allows $2\frac{1}{2}$ degrees of longitude between the *heads* of the two gulfs, or about $138\frac{1}{2}$.

Here then we have of modern authority—

Pococke	146	General mean 140.
Thevenot	$150\frac{1}{4}$	
Shaw, at a mean	137	
and of ancient		
Theod. Tables	$128\frac{1}{2}$	
Ptolemy	$138\frac{1}{2}$	

The construction gives only 136.

The road is said to be very hilly and rough, so that there is no question, but that the caravan rate to Mecca, through Syria and the Hejaz, is too high for this part: but one cannot suppose a difference of 10 to 14 miles; therefore we cannot undertake to solve the difficulty.

We conceive that, in allowing 55 G. miles between Sinai and Ailah, the utmost limit has been given, according to the statements of travellers. M. Niebuhr allows 83 from Toor, and we have 82.

Sharmee is a port in the Gulf of Ailah, a day and a half's journey to the SE. of the convent of St. Catherine, according to Dr. Pococke: and from thence, the gulf is said to extend upwards, in a NNE. direction, to the head. This also agrees to our position, and it must not be forgot, that M. Niebuhr exceeds our distance from Suez to St. Catherine's by one mile and a half only.

M. D'Anville allows 115 only, between Ajerud and Ailah.

Possibly the coast may lie more eastwardly, between Suez and Toor.

Lines from Ailah to Damascus and Jerusalem.

There is a modern road from Damascus to Ailah, and also an ancient one over the same ground, but imperfectly given. There is also an ancient and a modern one nearly over the same ground from Jerusalem to Ailah; and a modern one from Jerusalem to Sinai. These lead on different sides of the Dead Sea.

That from Damascus is traceable on the Pilgrims' route, towards Mecca, as far as Belkaa, 6 long journeys; and, probably, if we had the particulars, in Abulfeda, as far as *Petra*, 4 or 5 days farther.

Abulfeda's brief description of the road is as follows:—

	Days.
Damascus to Masherik Hauran[1], (that is, Bostra, the capital of Hauran)	3
To Belkaa	6
To Harah	3
To Ailah	3
	15

[1] This place appears to be known by several different names; as Masherik, Mezarib, Bostra, and also Hauran, as the principal

Now it is morally certain that the portions of distance between Bostra and Belkaa, Belkaa and Harah, have been transposed; because it is well known from the route of the pilgrims, that between Hauran and Belkaa, there are only 32 hours; as between Damascus and Hauran, 24 or 25. Moreover, that Belkaa (which is the principal town of the province of the same name) is only 12 hours south of Ain-Zarka, or Amman [2], which is 20 from Hauran; therefore, we ought to correct the 6 days to 3; and it will appear that the 6 belong to Harah, the next stage, which is 3 days short of Ailah; 62 MP. in the Theodosian Tables, equal to $44\frac{1}{2}$ G. miles only. But this last statement is erroneous; because the 3 days, or about 57 G. miles from Ailah, given by Abulfeda, are corroborated by its being 25 miles from *Gypsaria* (in Ptolemy); which is itself 48 MP. or $34\frac{1}{4}$ G. miles from Ailah, or *Elana*, on the way to *Elusa*, in the road to Jerusalem. The interval, then, between Hara, or Hawara and Belkaa, will be about 108 miles; answering to the 6 days.

town of that district; or it may be a station very near it. It is reckoned the third caravan journey from Damascus; but they must be short journeys; or possibly the first journey may be a short one from Damascus for the purpose of assembling the people of the caravan, a usual practice.

[2] Ain-Zarka is the principal fountain of the river Zarka or Zerka, the *Jabbok* of antiquity. It springs from under the fortress of *Rabbath Ammon*, called also *Philadelphia*, and *the City of Waters*. In these thirsty regions springs acquire a value and a distinction above all other things.

Petra is a station that claims the first notice in or near this line, although not mentioned by Abulfeda. It is the place so famous in ancient history as the capital of the Nabathean Arabs, on the south of the Dead Sea, now supposed to be the Karâk, or Shobek, in Abulfeda's Syria, and in Hajy Kalifa. It is necessary to fix its position, as the desert route of the Syrian pilgrims is determined by its connection with Maan.

Petra occurs in the route from *Elana* or Ailah, to the lake *Asphaltites*, in the Theod. Tables; therefore, is likely to have been in Abulfeda's route. It is given at 38 MP., or 27 G. miles from *Havara* (Abulfeda's Hara), and from the lake *Asphaltites*, (in Diodorus) *more* than 300 stadia; for Demetrius, on leaving *Petra*, is said to have marched 300 stadia to the *neighbourhood* of that lake; and the south end of it, as may be concluded. It is unlucky that the Theod. Tables do not give the line complete, as a stage is omitted between *Petra* and *Thoana (or Thorma)*; but it may be supplied in more than one way. First, by Ptolemy's distance between *Zoara*, at the south end of the Dead Sea, and Petra, $32\frac{1}{2}$ G. miles, which is little more than may be taken on the report of Diodorus. Or, by taking Ptolemy's distance of 15 miles from Thoana, (also near the SE. corner of the same sea) to *Necla*, the stage omitted in the Tables, and thence 22 MP., equal to $15\frac{3}{4}$ G. miles, from *Necla* to Petra; total, $30\frac{3}{4}$. In this case 32 remain between the assumed position of *Petra* and *Havara*, equal to 45 MP., and 38 appear in the Theod. Tables. But if the $32\frac{1}{2}$ G. miles of Ptolemy, from

the Lake or Dead Sea, be taken, the accounts will agree within 2 miles.

At all events, 30 G. miles may be taken for the distance of *Petra* to the south of the Dead Sea.

In the next place is to be considered, the line of direction in which Petra lies from Ailah, and from the Dead Sea.

It is to be understood that Petra, in the Theod. Tables, lies in the road from Ailah to Damascus; and skirts the SE. part of the Dead Sea; and that the bearing from Ailah to that sea is about NNE. $\frac{1}{2}$ E.; so that Petra is probably not much out of that line, especially as Hawara is proved, by its distance from *Gypsaria*, to lie *nearly* in that direction (but rather more easterly) from Ailah.

There is a very excellent cross line of distance to it from Gaza, if Pliny's numbers be not corrupted. They are 135 MP., equal to $96\frac{1}{4}$ G. miles; but this appears to carry it rather too far to the east. There is also another cross line from *Lysa*, if that position was fixed. It may, however, be approximated; for it lies on the ancient road from Ailah to Jerusalem, 76 MP. or 54 to 55 G. miles; and Ptolemy places *Petra* 47 to the NE. of it.

An approximation is, however, obtained; and for greater accuracy, we call in aid the position of Maan, or Mahan, a fortress on the pilgrims' road from Damascus; and in such a situation as to make it likely to be the *Theman* of Eusebius, 15 MP. from Petra to the SE. If then Maan can be fixed, Petra will be fixed also.

Maan is mentioned by most of the Oriental geo-

graphers as a small city and castle belonging to Sharat; and one day's journey from Saubekh, by which *Petra* is understood [1]. Another account says one journey from Shobek, a castle on the road of the pilgrims [2]. Abulfeda gives its latitude at 30 degrees.

This place is at 97 hours from Damascus, in Mustapha's Journal [3], which, at 1·956, his rate, gives 189¾ G. miles; and this line laid off on the pilgrims' route, through Bosra, Amman, &c. falls at 5 miles only to the southward of the position above assumed for Petra (said to be 15 MP. or 10¾ G. miles from it); and in lat. 30° 22′.

Hence, it appears, that the positions of Petra and Maan do really approximate; and Maan is situated on the pilgrims' route toward Medina, which one would not suppose pointed much to the west after passing the Dead Sea. It is indeed given by Ibn Haukel at 6 days, or 114 G. miles from Yaffa; which would carry it as much too far to the west, as Pliny's from Gaza does Petra to the east (of the apparent positions of the two places, Petra and Maan). We have, therefore, taken a mean, or a kind of *common centre*, between the two, in respect of Gaza or Yaffa, by placing Petra 87½, instead of 96¼ from Gaza; and Maan 122, instead of 114 from Yaffa.

In this position, Petra bears nearly south from

[1] Abulfeda, Syria, p. 14.

[2] Hajy Kalifa's Syria. The name of this place is variously spelt by the different translators—Maan, Mahan, Moan.

[3] It is also 97 in the History of the Wahabis; but 107 in Abdulkurreem.

the Dead Sea, and Maan S. a little east. And Petra in lat. 37° 27′ 30″, which is given by Ptolemy 30° 20′: Maan in 30° 16′ 45, which Abulfeda gives at 30 degrees exactly. It is unfortunate that there should be no modern line of distance across Palestine any where to the south of Jerusalem.

Ailah and Sinai to Jerusalem.

The ancient road from *Ælana*, or Ailah, to Jerusalem, has been already mentioned in pp. 84. 89, as given in the Theodosian Tables at 219 MP. or about 156½ G. miles in direct distance. It passes through the desert of *Tiheh*, or of the *Wandering* (of the Israelites); and through *Elusa*, whose position being given at 53 MP. from *Thamera* (now Tamara), near the south end of the Dead Sea (in the same Tables), and 71 to the southward of Jerusalem, serves to correct the direction of the line of the road in that part. It is again checked at *Lysa* and *Gypsaria*; from *Petra* and *Havara*, in the route from Ailah to Damascus. (See No. IX.) And hence it would appear, that *Elusa* stood at an angle to the west, in respect of the direct line from *Ælana* to *Jerusalem*; but that it lay in a direct line from *Sinai* and *Phara* to Jerusalem. And, accordingly, Mr. Wortley Montagu informs us, (Phil. Trans. for 1766), that there is a common road from Sinai to Jerusalem, of eleven journeys. The distance being such as to require 18¾ G. miles per

day, is indeed high; but if reckoned from the convent of St. Catherine's, would be reduced to the more probable standard of about 17¾.

Mr. Montagu gives the particulars of the road as follow:—first from Sinai to Pharan, two journeys; thence to Sheik Ali, three; thence to certain ruins, (taken for those of *Berzamma*), one and a half; all in a north direction; and, finally, to Jerusalem, by *Hebron*, (Kabr Ibrahim), four or more, or rather four and a half.

He mentions also a second road from Sinai to Jerusalem, more circuitous, as passing through Dahab, on the Gulf of Ailah; and falling into the former road at Sheik Ali. He says that the caravans of pilgrims to Mecca, from Cairo and Jerusalem, join at Sheik Ali. Doubtless *Ailah* is intended.

SECTION V.

Palmyra, and its connection with Aleppo, Racca, Rahabah Malek, Hems, Hamah, and Damascus.

It may now be proper to examine how far the authorities for the extent and distribution of the space between Rahabah Malek and Damascus; and between Rahabah and Hems; agree: all of them being established points on the construction. This head of enquiry will necessarily include Palmyra, which is an intermediate step between Rahabah, Racca, and Damascus; and whose position is very

faulty in our best maps. The process meant to be followed, is, to establish the position of Palmyra, by the aid of the lines of distance to it, from every other quarter, save Rahabah and Damascus, in the first instance; and afterwards to compare the lines from those places respectively.

The positions of Racca and Ain-al-Koom on the NE.; together with Hamah, Hems, and Hassia, on the N. and W. of Palmyra, have been already fixed[1]. From these, certain lines of distance will be laid off; by which, without the aid of the latitude by observation, which is wanting, it is expected that Palmyra will be placed nearly in its true position.

It is remarkable enough that its latitude should not have been taken properly by any modern traveller. Messrs. Dawkins and Wood say, that a quadrant "would have *encumbered* them;" which excuse is very remarkable, as they allow that they carried with them *tools for digging into the ruins.* Mr. Bruce informs us that his quadrant was warped; his observation is, therefore, to be laid out of the question. Ptolemy, as well as Mr. Bruce, allowed 34 degrees, exactly, and Abulfeda has the same; perhaps he copied Ptolemy, or as his latitudes in Syria are commonly 20 minutes too far southerly, this might be the case here; and that would approach near to what appears to us to be the truth. Nasereddin and Ulegbeg are silent.

After what has been stated in the course of the present division of the work, concerning the latitudes

[1] See pp. 39. 42. 66, 67.

and general positions of Ain-al-Koom, Hems, and Hassia, it is presumed that the reader will admit the general truth of them: and that they are placed conformably to the *data*, of which so complete an exposition has been made; and are in harmony with the surrounding positions.

The English gentlemen belonging to the factory of Aleppo, who made the *second* visit to Palmyra in 1691[1], (the first having been in 1678), returned by way of Ain-al-Koom and Baulus, as has been already mentioned. They remark, that on leaving Palmyra they went to Yareeca, in the direction of east *a little* north, $5\frac{1}{2}$ hours; thence to Soukney, the Sukana of Texeira, NE. 7 hours; thence to Taiba, NE. *or more easterly;* and on to Ain-al-Koom $2\frac{1}{2}$ hours beyond Taiba. And as the whole time between Soukney and Ain-al-Koom was 7 or 8 hours, say $7\frac{1}{2}$, Taiba must of course be 5 hours from Soukney.

Here are 20 hours or more between Palmyra and Ain al-Koom, for which $2\frac{2}{3}$ G. miles *per* hour may be allowed, as was calculated on that part of their journey between Ain-al-Koom and the neighbourhood of Aleppo. That it was much at this rate, we learn from Texeira, who reckoned 6 leagues (in effect *hours)* between Sukana and Taiba: his leagues produce, on a large extent of ground, 2 G. miles and a small fraction each, or 13 miles for these 6 leagues, which agrees exactly with the other account. On another occasion these travellers were 4 hours in

[1] See Phil. Transactions for 1695, vol. xix.; and also the History of Palmyra.

going the 4 farsangs (of Yacutus) between Resafa and Aff Dien. The 20 hours then may be taken at $54\frac{1}{2}$ G. miles direct.

A second report is from Mr. Beawes, in 1745, but he did not travel over the ground. He was informed, whilst at Ain-al-Koom, that Taiba was distant 7 (British) miles; that Soukney was 6 hours from Taiba; and Palmyra 14 hours from Soukney; in all, about 22 hours from Ain-al-Koom, or 2 more than the travellers from Palmyra report: but it is unlikely that the hours pointed out to Mr. Beawes were at so high a rate as the party of gentlemen travelling *light*. It is probable that 2·4 is a rate sufficiently high for the mode of travelling in contemplation, which would agree very nearly.

A third report is from Mr. Bartholomew Plaisted, a sea officer, and marine surveyor of considerable eminence. When at Taiba, in 1750, he was told that Palmyra was 60 miles to the SW. These miles, if taken for British, and in *road* distance, as may be concluded, will give about 46 G. miles direct, which, added to $6\frac{3}{4}$ for the $2\frac{1}{2}$ hours between Ain-al-Koom and Taiba, make a total of $52\frac{3}{4}$. So that the three accounts differ very little amongst themselves; and we prefer the one of the travellers who went over the ground, that is, $54\frac{1}{2}$.

The Theodosian Tables have 63 MP. only. It may be suspected that on some of the roads in Syria the Arabic mile has been used in this document.

It has already been remarked, (p. 40), that the bearings of *the travellers* were reckoned too much *eastwardly*. Taiba is allowed by intelligent per-

sons to bear nearly south from Ain-al-Koom; and Carmichael says that Sachney (another reading of Soukney) bears S. by W. from Taiba. Now the bearing between Soukney and Taiba is reported by the travellers to be NE. or more easterly. Their general bearing, then, which they appear to have reckoned NE. easterly, should rather be corrected to N. 30° to 35° east.

If Mr. Plaisted looked at his compass at Taiba his true bearing should be taken at about S. 37 W., as the variation then was about $\frac{3}{4}$ of a point [1].

Mr. Beawes reckoned the bearing SW.; so that, with variation allowed, (he certainly *had* a compass by the nature of his bearings), the true bearing might be about SW. by S., or S. 35° to 36° west. So that Plaisted and Beawes appear to have reported a more *southwardly* bearing than the Palmyra travellers, although *their distance* is most to be relied on.

Having now ascertained, as well as the authorities will admit, the distance and general bearing of Palmyra from Ain-al-Koom in the NE. quarter, and, in consequence, from Racca, as the connection of the two places is already explained in page 34, *et seq.*, we shall next examine how it stands in respect of Hamah and Hems on the NW. and Hassia on the west.

Golius informs us (p. 126) that the distance is 2

[1] Most readers may not be aware with what exactness the bearings, or lines of direction, between very distant places are pointed out; but experience proves the fact: and in this case the informants were probably the Arabs of this quarter, who traverse the whole country.

journeys from Hamah to Salamiyah; and Abulfeda that it is three from thence to Palmyra[1]: hence we have an aggregate of 5 days, or 95¼, according to the Oriental Geographer's Scale of Journeys, Salamiyah lying directly between.

Messrs. Dawkins and Wood, in 1751, went from Damascus to Palmyra to collect materials for their splendid and national work on the antiquities of that place. They went by way of Hassia, whose position is given in detail in page 76, in latitude 34° 22′, and at 22½ G. miles S. 9° E. from Hems.

These illustrious travellers were 4 days between Damascus and Hassia, which Thevenot went in 30 hours: nor is the cause explained; but it is necessary to remark it, as it must be taken into the account when the remaining part of their journey is examined, and applied to the purpose of ascertaining the longitude of Palmyra.

From Hassia their course was said to be E. by S. 4 hours to Sudud; but as Mr. Wood, on his return, was only 5 hours from thence to Karaw, though at a quicker rate than the 4, yet it proves that the bearing

[1] Abulfeda says that it is a distance of 3 journeys from Hems, *eastward*, to Palmyra, and the same from Salamiyah to Palmyra. This, of course, must be erroneous, as it concerns the former. It is to be regretted that he does not give the distances in *miles*, as his local knowledge of Syria must have enabled him to do. The standard of his journeys also varies; whereas that of Edrisi is almost universally 18 Arabic miles, or 19 Geographic. Abulfeda's, too, is more *commonly* that than a higher number. Between Kufa and Baulus, 20 journeys, they come out 19 G. miles each; but on the 4 between Damascus and Salamiyah, and the 7 between Salamiyah and Baulus, 24 to 25½ are required.

should rather be a point and a half more southwardly. (See Map No. XI.) From Sudud to Carietien, E. by S. ½ S. 6 hours; and from thence, 24 hours on a course *somewhat* to the north of east. This brought them to the end of the plain, from whence it was 2 British miles through the hills to Palmyra, *implied* to be on the same easterly course[1].

Now as any degree of *northing* that could well be perceived in this line of distance can hardly be supposed to be less than *half a point*, it may be supposed to counterbalance, fully, the southing on the two first lines of 10 hours, collectively, and at least place Palmyra in as high a parallel as Hassia; but the probability is, that it is rather to the northward of it.

The information obtained by this journey is of the best kind, short of geometrical and astronomical processes and observations; and is particularly applicable to the determination of the position of Palmyra, whether in point of latitude or of longitude. For, noting the general bearing, it approximates the parallel; and travelling with camels, whose pace is so uniform and so well ascertained, the *distance* is approximated still closer.

It ought to be remarked, in the calculation of the distance, that the 24 hours were gone through without regular halting, there being no water by the

[1] There is no question but that Mr. Wood allowed the variation of the compass; if he had not, as there were about 8 degrees at that time, westerly, the bearing he gives would have placed Palmyra 9 or 10 min. of latitude more to the north, which could not well be.

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way; and this may have operated rather to lessen the rate through fatigue.

The whole account then is 34 hours and 2 British miles from Hassia to Palmyra. For this, altogether, we have allowed 74¼ G. miles *direct*, being the rate on the Great Desert 2·14 on the 34 hours; and 1½ G. miles for the 2 British, *through the hills*, added thereto, within a fraction of a mile. One cannot well suppose a higher rate, when the shortness of the journeys from Damascus to Hassia, 15 to 16 G. miles, is considered.

Mr. Charles Vaughan was told, at Hems, that it was reckoned 36 hours from thence to Palmyra. If these be taken at the above rate, they produce 76¼ G. miles; and the point assumed by Mr. Wood's distance requires 78½, so that the difference is only about a *fortieth* part.

It will appear, on the closing of the account, that the different reports will not vary amongst themselves more than 5 G. miles.

In the Philosophical Transactions of 1695, Vol. XIX. are found the journals of two parties of English gentlemen, who, in 1678 and 1691, travelled from Aleppo to Palmyra, as remarked before. The first party were unsuccessful as to the object of their journey, which was to view and examine the celebrated remains of that place; they being ill-treated and plundered by the Arabs residing there; but the latter party succeeded to their wishes: and these seem to have been the first visits made by Europeans to that place since the date of ancient history. The journals are highly interesting.

To the first party we are the most indebted on the score of geographical information in the line between Aleppo and Palmyra. They took compasses with them, and thence were enabled to determine, generally, in so open a country, the bearing of Palmyra from Aleppo. They say, page 138, "As far as we "could conclude from our journeys, and the position "of the ways taken by two good compasses, the dis- "tance of Tadmor from Aleppo is about 150 English "miles, and the course SSE. or rather somewhat "more southerly, considering the variations of the "compass, which is *above half a point* WESTWARD in "these parts."

The magnetic bearing, then, was SSE., and as to the variation, it ought to make it more *eastwardly* rather than *southerly*, as the *north* is to be taken more *westerly;* and then the true bearing will be about SSE. ½ E. or S. 28° E., reckoning the variation half a point [1].

There is a presumptive proof of this being pretty near the truth by the circumstance of the position of the well of *Costal*, mentioned above, in page 66, and to which we beg leave to refer. That well differing no more than 3½ degrees from the *corrected* bearing from Aleppo, when placed in respect of Racca and Hems, and agreeing positively with the assumed distance, will satisfy us that the *general* bearing of Palmyra is right.

It is certain that the latter part of the route, be-

[1] It appears extraordinary that this error, either in point of *fact*, or of *expression*, should have been overlooked.

tween Costal and Palmyra, is but imperfectly given as to bearings, and therefore the *detail* will not determine the bearing of Palmyra from Costal. There is, in particular, great doubt respecting the truth of the 9 hours on an ESE. course, when the general course is SSE. through an open country. Moreover, the general bearing of SSE., given by the travellers, and which was probably made up from their notes taken on the spot, ought to be the best guide in the present case, especially after the instance of the agreement of Costal.

We here copy from the journals the bearings and distances (time) on each route.

1678.		Hours.
From Aleppo to Caphirabad .	SE.	$4\frac{1}{2}$
Churraik . . .	SSE.	$10\frac{1}{2}$
Andrene . . .	ESE.	2
Sheik Alal .	S. by E.	4
Briadeen . . .	S.	2
Costal	SE.	4
		27
Place and bearing wanting .	—	3
G'hor	ESE.	9
The remainder supplied from 1691, about	S. by E.	6
		45

1691.		Hours.
Caphirabad . .	S by E.	4
Emghir	—	$1\frac{1}{4}$
Urghee	—	1
Sheik Ailah . .	—	4
Zerga .	SE. or more E.	6
Esree, (i. e. Seriah or *Seriana*) .	—	7
Imp-Malka-Jiub, (a well) . .	—	$6\frac{1}{2}$
Myrrha	—	$2\frac{1}{2}$
Wishal	—	$8\frac{1}{2}$
Palmyra, about .	S.	$6\frac{1}{4}$
		47

These roads appear to separate at Sheik Ailah, $10\frac{1}{4}$ hours from Aleppo; the first passes *through* Andrene, the other, in sight of it, lying to the west,

at the distance of, apparently, 2 hours' journey; and afterwards through Esree, the *Seriana* of the Antonine Itinerary, 18 MP. from *Androna* (Andrene). This road also leads close to Antoor, on the *east*, the other somewhat to the *west* of it. Antoor (a castle) appears to be about 5 hours short of Palmyra, to the N. or N. by W.

The computed distance of the travellers, 150 English miles, (by the *road*, of course), will produce 118¾ G. miles in direct distance, allowing a *twelfth* part for the inflexions of the road. If the time be taken, 46 hours at a mean, and 2⅔ be allowed, (as in the other parts,) 122⅔ is the result. But the last 6 or 7 hours are not given accurately in either of the two accounts; at the same time the error cannot well amount to more than a hour either way.

It appears in the same narrative that the gentlemen reckoned the distance six *easy* journeys for small parties on horseback; and ordinary journeys in Syria being about 26 or 27 miles, or in direct distance, in such an open track, 20 to 21 G. miles, give a total of 120 to 126 miles; (they, however, reckoned only 25 road miles per day.)

A mean of these three computations gives 121½; and this distance laid off from Aleppo, on a bearing of S. 28 E., places Palmyra in lat. 34° 24′, long. 38° 20′.

It will now be proper to enquire how far the other authorities agree with this important line from Aleppo, considered as a standard.

In the first place, the line of 54½ G. miles from Ain-al-Koom, (page 98,) agrees exactly. Mr. Wood's

line from Hassia, (page 102,) of 74¼ G. miles, also agrees exactly. Mr. Vaughan's, of 76¼, from Hems, (page 102,) also falls short, and by nearly 3 miles. The line from Hamah, by Abulfeda and Golius, of 95¼, (page 99, 100,) *goes beyond* Palmyra by about 2 miles.

Hence it appears, that the difference amongst the authorities, even admitting the *hearsay* ones of Plaisted and Beawes, differ no more than about 4 or 5 miles: in other words, that all the different lines of distance from Ain-al-Koom, Hassia, Hems, and Hamah, being drawn towards the position assumed on the faith of the travellers from Aleppo, they fall within a circle of 2¾ miles in diameter around that position, which we have stated to be in latitude 34° 20′, longitude 38° 20′, or 1° 10′ east of Aleppo. It may be remarked, that the bearing from Ain-al-Koom will finally appear to be S. 32° W.

Having thus (we trust successfully) placed Palmyra, in respect of the neighbouring stations, it will be found that the space between it and Rahabah Malek, on the east, is 105 G. miles, answering to 99¼ Arabic miles; and between Palmyra and Damascus, 110 G. miles, equal to 104 Arabic: but that Abulfeda has 102 A. miles for the former interval, 95 for the latter; so that the construction falls short 2¾ on the first interval, and exceeds by 9 on the latter; or, on the whole, exceeds by 6¼ Arabic miles, or in the proportion of 3 in 100 [1]. Whether this be the effect of error in our construction, or in Abulfeda's

[1] The originals of Abulfeda have 59 A. miles between Palmyra and Damascus; but as the interval on the construction is 104, it is more probable that he meant 95 than 59.

ideas, cannot be determined: it is certain that the error would have been reduced to 4, had Carmichael's original bearings been adopted.

Mr. Wood, on his return from Palmyra, reckoned 48 hours between it and Balbek. At the ordinary camel rate this would have produced 101½ G. miles *direct;* but an acceleration of rate (page 59) that took place during the last 17½ hours, increases it to 110¼; on the construction there are 109.

Upon the whole, when the nature of the materials on which the position of this place is founded is considered, it appears extraordinary that the different authorities, drawn from such various sources and opposite quarters, and totally independent of each other, should coincide so nearly. We are therefore led to hope, that although we have not absolutely fixed the geographical position of this celebrated place, that it is at least approximated.

M. D'Anville places Palmyra in lat. 34° 10′, and nearly 2° east of Aleppo, which is about 40 G. miles to the eastward of our position.

Although Mr. Wood's party could not but know the relative position of Palmyra to Damascus and Tripoli, on the west, yet they mistook it greatly in respect of the Euphrates: they supposed it to be no more than 20 leagues from it, whereas the nearest part, to the N., is very nearly 30; and on the east (the part they had in idea) it is 34 marine leagues, or 102 G. miles. This misconception led Mr. Wood into a great error respecting the track of Cyrus and Xenophon across the Desert. Mr. Wood is surprised that Xenophon does not speak of Palmyra!

One is also surprised to read in his admirable work that "the distances (as given by Pliny) were to-"lerably exact, but somewhat too large." Pliny's distances are, 337 MP. from *Seleucia*, on the Tigris; 203 from the nearest sea-port on the coast; and 27 less (or 176) from Damascus [1]. It appears to us that the distance from Seleucia is too short by 110 MP.; that from the nearest sea-port, which was *Marathus*, it was 167; but the 203 would agree to *Laodicea;* and that the distance to Damascus is too great by 24.

From the hills over Palmyra Mr. Wood had a view of the summit of Lebanon, and of that part of Anti-Lebanon near Hassia, and could take "*very dis-*"*tinctly the bearings*" of the *latter*. From this one might conclude that they were in the habit of taking bearings of distant lands from elevated situations during their tour. Such bearings would have been highly useful in a work like ours, where we are often compelled to substitute circumstantial for positive evidence, which swells the work without any addition to the value. In the present case the bearing of Mount Lebanon would have determined the parallel; for the cedars bear, as nearly as possible, west from Palmyra, distant about 130 British miles. Those specimens which they have given us of their journal make us lament exceedingly that their travels in general, enriched with such particulars as they have set forth in the specimens, have not appeared. Slight

[1] The numbers differ in different editions of Pliny, (lib. v. c. 25.) We have copied those extracted by M. D'Anville, on a supposition that he had examined several copies.

as the geographical notices that occur in the Journal may appear, they have greatly assisted in placing Balbek, Damascus, and Tripoli; and have also gone a great way towards verifying the position of Palmyra [1].

It were to be wished that when such bearings have been taken, they were to be inserted, together with the Itineraries, at the end of the book, as appendixes. It would have added greatly to the value of Mr. Wood's splendid works had such useful remarks been inserted.

Ptolemy has placed Palmyra very well in point of distance from Racca and Aleppo, *(Nicephorium* and *Callinicum,)* it being 110 from the former, whilst we have 104, and 122 from the latter for our 121½. But then, as the bearing of the coast of Syria is too oblique from the meridian (to the west) so the bearing of Palmyra is proportionably wrong, being S. 11 E. instead of 28°. But he comes nearer to the truth than the modern maps in the matter of relative position.

On a reconsideration of the Sections III. and V. it has appeared to the author, that was this geography to be constructed *de novo,* some improvements might be made: and this is mentioned as a hint to others.

It is probable that we should allow somewhat less

[1] Of so great utility are such remarks, that even one of the views of Balbek enabled the author to determine the direction of the valley from whence the *Orontes* springs.

distance between Damascus, Palmyra, and Rahabah, as well as between Gaza and Egypt. In effect, it appears as if the coast of Syria took a more *oblique* course between Sidon and Gaza, and perhaps a more *meridional* one between Sidon and Latikeah; so that Damascus may lie more to the east, although no farther distant from the coast.

But to employ months or years in correcting small errors, which implies *reconstruction*, when the whole process is founded on computed distances, would be a waste of time.

The distance between Suez and Ailah also requires investigation, as does the French observation of longitude at Suez, which differs so much from Mr. White's, and from the land route from Kahira. It certainly appears that Mr. White's observations agree best with Captain de Haviland's measurement of the road.

CHAPTER II.

THE NORTHERN QUARTER.

SECTION VI.

Line from Kaswin to Erzerum, Trabezon, and Diyarbekr.

HAVING completed the chain of positions, generally, throughout Syria, Mesopotamia, and the adjacent countries on the south-east, we turn towards Armenia, Aderbigian, and other countries on the north. Here, the first line that presents itself is that between Kaswin and Trabezon, both of which are determined by celestial observations. It will be necessary, in this place, to say a few words respecting the longitude of Trabezon.

M. de Beauchamp's observation of longitude at Trabezon, recorded in the *Mem. Egyptienne*, Vol. ii. gives 39° 37′ from Greenwich, lat. 41° 2′ 40″. But finding it difficult to reconcile this position with those to the eastward of it, and hearing that there are doubts respecting the accuracy of the observations themselves, we have ventured to depart from it so far as to place Trabezon 6½ G. miles farther to the west, or in longitude 8½ min.; so that it stands on the construction in 39° 28′ 30″, instead of 39° 37′.

And, as it was proper that all the other longitudes should bear a proportion, that the intermediate distances might not be distorted, Sinub is taken at 35° 1′, instead of 35° 6′, and Arackaly 31° 25′, instead of 31° 27′.

The line of distance in question is required to be traced for the distribution of more than 550 G. miles of space, in which there is no one observation either of latitude or longitude till within 80 or 90 miles of its extremity, and there the latitude only; for the longitude reported in the *Con. des Temps* cannot be right. This place is Erzerum. There arise in this line many stations from whence lines of distance emanate to the northwards; and others on which lines from the southward terminate. The materials, on the whole, are not of the best kind; and the cross lines of distance, of which there are 6 or 7, are sometimes too oblique to afford satisfactory checks. With all these disadvantages, no accurate results will be expected, but it is necessary that something should be done.

Maraga (or Meraugheh), Meianna, and Zengan, points already fixed in the line from Aleppo to Kaswin, (§ 1.) are included in this present one; so that, in the first instance, we retrace about 160 miles of that line, and commence the present enquiry at Maraga.

Although Trabezon is the proper termination of this line, yet Erzerum will be a more convenient one, as it can only be fixed in relation to Trabezon, and even that not in so satisfactory a mode as could have been wished.

Erzerum, in some former copies of the *Con. des Temps,* is given at 37° 37′ 30″ east from Paris, or 40° 37′ 30″ from Greenwich, latitude 39° 56′ 30″. The observation is marked with a *, said to signify that it was taken by a person *not* a member of the Royal Academy. It might, however, have been equally good if there had been no other objections; but it certainly appears to be a good many minutes more to the east.

There is no positive authority by which Erzerum can be placed in respect of Trabezon. The reputed distance is 6 journeys; but the road lies across a wide and difficult chain of mountains, so that the true *direct* distance is difficult to be approximated; and the smoother way is so remarkably circuitous, that Tournefort was 13 days in travelling it, in the suite of a Turkish Pasha[1]. For the road lay nearly parallel with the coast of the Black Sea, at the distance of about a day's journey, for about 60 G. miles; from whence they struck directly south to Erzerum, about 66 more. At the same time the bearing of Erzerum from Trabezon appears to be about SE. or SE. ¼ S.

The direct road, or rather the less circuitous one, is said to go by the silver mine of Gumish-kend, probably because the road is better made, and more frequented and safe. But we have reason to conclude that even this road is very circuitous likewise, though less so than by Baibort and Gresi; for those who

[1] He says that they travelled only 12 to 15 miles a day; meaning *by the road.*

have gone by Gumish-kend passed Teke and Arousga, and fell into the same road with Thevenot during the last 40 miles to Erzerum.

If the trace of this route be reduced to a direct line, 86 or 87 G. miles would be the extent of it, although, if measured through Gumish-kend, Arousga, &c. it would measure 110 or 112. Indeed, Tournefort says that Erzerum is no more than 5 days from the *sea;* and Awaf, which is 75 G. miles from the assumed position of it on the above authority, is the nearest part of the sea-coast.

Erzerum is placed accordingly at 87 G. miles from Trabezon, in lat. 39° 56′ 30″, long. 40° 41′. It will be found in the sequel that this position does not disagree with the report of the distance from the side of Siwas and Kisariah. (See § 19.)

The positions of Maraga and Erzerum being disposed of, the line will be reduced in its length by nearly one half; and the part remaining is subdivided into two nearly equal parts by Barghiri, or Barkeri, a town at the N.E. extremity of the lake Wan [1]. There being a line of distance from Diyarbekir to this place, it will be best to fix the position of it in the first instance, as the authorities between Barghiri and Maraga are not of the best kind, and are also scanty; whilst that from Barghiri to Erzerum may be better relied on, as being the report of M. Niebuhr.

As Barghiri occupies the NE. angle of the lake of

[1] This name is written variously by Abulfeda, Edrisi, Ibrahim, &c., and is either Barghiri, Barkeri, Barcori, or Perkeri.

Wan, so does the city of Wan, from whence the lake is denominated, the eastern part of its shore. M. Niebuhr's line of distance extends to Wan; but as Barghiri is the point to which the distance from Maraga is reckoned, it will be proper to consider *that* as the point of meeting of the three lines from Erzerum, Diyarbekir, and Maraga: the position of Wan will therefore be adjusted to Barghiri. There are also lines of distance from Diyarbekir to Wan by the *south* of the lake, as to Barghiri by the *north;* and the latitude and longitude of Wan are given in the Oriental Tables.

The line from Diyarbekir leads through Miafarakin, Moosh, Aklat, and Argish, and points about E. by N. ½ N.

Miafarakin is given by Edrisi at 2 journeys from Diyarbekir. Abulfeda says a day and a half; but Edrisi repeats the 2 days in different parts of his book; and it is taken accordingly at 38 G. miles. Its latitude is given from 38° to 38° 15′ by the Tables; that is, by Abulfeda at 38° 15′, by Nasereddin and Ulegbeg 38°: a mean is taken at 38° 7′.

There is also a line from Argana to Miafarakin in Edrisi. Argana is placed in § 19; and the distance to Miafarakin, 54 A. miles, or 57 Geogr., will be found to agree.

Moosh, according to Abulfeda, is 2 *short* journeys from Miafarakin, say 36 G. miles, and to the NE., because its latitude is said to be 38° 30′ in the Tables, and because Mount *Taurus,* or rather the continuation of it, under the name of *Niphates,* lies

between the two places [1]. Then Aklat, called also Kalat, situated at the west side of the lake of Wan, is said by Abulfeda to be 3 journeys to the eastward of Moosh, the *plain* or *meadow* of Moosh occupying the extent of the two first journeys [2]. Sherefeddin says the same. The latitude of Aklat is 38° 20′ in the Tables.

If these three lines of distance are laid off to the respective parallels given for each, or nearly [3], Aklat will stand at $122\frac{1}{2}$ G. miles, in direct distance, from Diyarbekir, and in long. 40° 36′.

Here it is proper to observe, that in the corrupt state in which certain parts of the Oriental Tables are found, it would be hazarding too much to rely on the single authority of the latitude of Aklat, for the point of termination of the *third* line of distance; and, indeed, of the whole line from Diyarbekir: although the same quantity is given by all the different authorities. We have therefore examined the latitudes of some other places that lie nearly under the same meridian, and find that the differences of latitude correspond, both in the aggregate and in the detail; so that the given parallel of Aklat may

[1] Tamerlane, or Timur, crossed these mountains, covered with deep snow, in the month of May (Sherefeddin), in his way to Moosh.

[2] The plain of Moosh answers to a part of the Western Armenia, described by Xenophon, in the Retreat: he speaks of the *plains of Armenia* after descending from the *Carduchian* mountains, and being on his march northwards, to the Euphrates. (Anabasis, lib. iv.)

[3] Moosh is placed in 38° 28′, Aklat in 38° 22′.

be generally depended on. The details of these examinations follow, as they comprise an important part of the construction.

Tadowan is a town situated at the SW. extremity of the lake of Wan, directly facing Berghiri, at the opposite corner. Its latitude is given by the Tables at 38° and 38° 5′, and by Tavernier at 2 caravan journeys *short* of Aklat, (that is, in coming from Diyarbekir.)

In the map of Ibrahim Effendi the form of the lake of Wan is given: it differs exceedingly from that in M. D'Anville, but agrees well with the materials now under discussion, and therefore affords great assistance in placing Tadowan, Argish, and other towns around it[1].

Tadowan, then, according to the form of the lake, will bear about S. by E. from Aklat; and, taking the 2 journeys at 22 G. miles, direct, as they conform to the winding shore of the lake, we have 21 min. or more for the difference of latitude between these places; and 20 is the number given[2].

Bedlis, or Betlis, is a place of very considerable note, both as a strong military position, and as the guard of a strong pass through the Kourdistan mountains, at the descent from them into the plains

[1] The length of this lake in Ibrahim's map is about 63 G. miles, between Tadowan and Wan. Edrisi allows 60 in length by 19 in breadth. But it appears that its extreme length, which is from NE. by E. to SW. by W., is about 51.

[2] The caravan journeys of Tavernier, through Kourdistan, are the shortest on record: in one instance 14 give $13\frac{1}{3}$ G. miles direct, for each day, when no lake intervened.

of Armenia [1]. Bedlis is placed in lat. 37° 45′ by the Tables, and is situated from Tadowan 1 long journey to the S. by W.[1] Accordingly, the difference of latitude between it and Tadowan may be taken, according to the distance and bearing, at about 16 min., or less, which agrees with the reported latitudes within a minute.

Malazkerd is a town 7 farsangs (Abulfeda) from Aklat, and, as appears by the construction (which will be proved in the course of this article), bears due north from it; so that the distance, upwards of 22 G. miles, will be the difference of latitude. Aklat, as we have seen, is placed in 38° 20′ in the Tables, and Malazkerd is in 38° 45′; so that, here, the reported difference of latitude exceeds by nearly 3 min. that given by the distance. But, taking the aggregate of the differences of latitude, and of the meridional distances, respectively, between Bedlis and Malazkerd, the former is just a whole degree, whilst the latter is 59: so that the latitude of Aklat may be adopted, *generally:* we have placed it in 38° 22′ 30″.

Argish is the next place in the line from Diyarbekir to Barghiri, and is situated at the NW. side of the lake of Wan, and, according to Abulfeda, 2 *short* journeys from Aklat. The form of the lake shews the bearing to be northeastward, and the distance 26 G. miles, which will agree to Tavernier's 2 caravan journeys. Its latitude is given in the Tables at

[1] The author conceives that the Ten Thousand descended within 20 G. miles of Bedlis, to the west.

[2] This is inferred from its distance from Wan.

38° 30′; but the bearing and distance require about 6 min. more, and we have taken 38° 37′.

Malazkerd, before mentioned, is determined by the distances from Aklat and Argish; from the former 7 farsangs, or about 22¼ G. miles, and from the latter 10 hours, according to M. Niebuhr, for which 22 miles are allowed. This places it due north from Aklat, as has been already mentioned in page 118, as well as its parallel, 38° 45′. It may be proper to observe, that it is a point in the line from Erzerum to Barghiri, which is the next stage to Argish, and from the form of the lake, bearing a little to the north of east from it.

The distance of Barghiri from Argish is given by Abulfeda at 8 farsangs, or 25½ G. miles; by Ibrahim 22; but both appear to be overrated, since M. Niebuhr allows no more than 15 hours, or, at most, 34 to 35 G. miles between Argish to Wan; and Barghiri is rather nearer to Argish than to Wan, according to Ibrahim's map. But, admitting the distance to be 37 or 38 along the lake, whose shore changes in its course from east northerly to south-east at Barghiri, 17 or 18 may be allowed from Argish to Barghiri, 19 or 20 thence to Wan; and then Barghiri will be in lat. 38° 40′ 30″, long. 43° 24′, and at 162 G. miles *in one line* from Diyarbekir, about E. by N. ½ N.

The line from Erzerum to Barghiri is now a very simple operation. Malazkerd, which occurs in it, is already placed (page 118), and is 37½ G. miles W. a little N. from Barghiri. The interval on the construction, between Malazkerd and Erzerum, is then

112 G. miles, and is formed of a route communicated by M. Niebuhr, (being part of one from Erzerum to Wan and Vastan,) which allows 56 hours between Erzerum and Malazkerd, and which may amount to little more than the interval, though 2 per hour is a low rate, but then it is the rate of a caravan over some very rough tracks. Thus we conclude the lines to Barghiri from Trabezon and Diyarbekir.

Before the examination of the line from Maraga to Barghiri is entered on, it will be proper to fix the position of Wan, the principal city of this region.

It has been remarked, that Wan is connected with Barghiri, (page 119), and that it may be taken at 19 or 20 miles to the SE. of it, or more strictly SE. by S. The latitude of Wan will, by this calculation, be 38° 24′, and in the Tables it is given at 38° 30′, which is coming very near in this kind of work. Its assumed longitude, at the same time, is 43° 36′; in the Tables, it is given at 3° 43′ E. of Diyarbekir, but is on the construction no more than 3° 31′ 30″. It must not, however, be forgot, that the Tables allow 26 minutes too much difference of longitude between Aleppo and Kaswin.

In this position, Wan stands at 162 G. miles from Erzerum *direct*, which is just 2 per hour for M. Niebuhr's 81 hours, and when the circuit round the northern part of the lake, from Argish, is taken into the account, perhaps the rate allowed is sufficient. It is, at the same time, 169 G. miles from Diyarbekir.

Ibrahim Effendi allows 187, but it must be remarked, that between Wan and the crossing place

of the river Kur (Zuat), he allows only 231 for our 252, so that on the whole, the account is balanced within 3 miles, on about 420. This idea of Ibrahim's is, however, worth remarking, although we cannot suppose that Wan is placed 18 miles too much to the west.

There are other lines to Wan and its lake, by the south. M. Niebuhr allows 24 hours between Tadowan and Wan, which appears to agree.

Mildenhall was 10 days between Diyarbekir and Wan, which agrees well with the 169, as he travelled with a party, not a caravan. He came through Bedlis, which he reckoned 3 days short of Wan.

All the routes by the north of the lake pass through Bedlis and Tadowan; for the early part of the road keeps to the neighbourhood of the northern bank of the Tigris, as far as Sered, or Seert, (taken for *Tigranocerta,*) which is 4 journeys according to Abulfeda and Niebuhr. Sered lies to the ESE. of Diyarbekir. From thence to Tadowan, according to M. Niebuhr, is 28 hours, through Bedlis; the principal part of the way lying across the Kourdistan mountains, and cutting the line of the Retreat of the Ten Thousand; the line of course is between ENE. and NE. by E. These routes accord very well with the general distance, although no geographical construction could be formed on them alone; 76 G. miles are taken for the 4 days of Abulfeda to Sered, and 58 for the 28 hours of M. Niebuhr, thence to Tadowan[1].

[1] Tavernier was 8 days from Diyarbekir to Bedlis, with a caravan; just 15 miles per day.

There is also a Roman road in the Theod. Tables, from *Amida* to *Vastauna* (Diyarbekir to Vastan), 225 MP., equal to 160½ G. miles direct, and on the construction there are 161½. All that may be necessary to say at present of this road, the details of which belong to Mesopotamia, is, that it leads through *Tigranocerta*, answering to Sered, or Seert, and appears evidently to be the same route now in use, by Sered and Bedlis, to Vastan; and Wan is reckoned 6 hours beyond it, by M. Niebuhr, coasting the SE. bay of the lake.

The line from Maraga to Barghiri is thus made out, though imperfectly.

Salmas is given by Abulfeda at 14 farsangs, or 44½ G. miles, from Maraga. Now, by the construction, it would appear that the lake of Maraga intervenes, so that no shorter line can be drawn than about 56 miles, rounding the north end of the lake, (whose form is taken from M. D'Anville,) or 11½ more than the distance given. On the other hand, there is no certainty that the lake extends so far to the north; and, moreover, both Edrisi's and Abulfeda's lines of distance are commonly such as are measured on a globe or map; Edrisi's professedly so. We, therefore, take the original distance as we find it. The latitude of Salmas is universally given at 37° 40″, and hence the position of this place is WNW. ½ N. from Maraga, 40 G. miles N. of Ormia, which is the given difference of latitude; but Abulfeda allows 16 farsangs, or nearly 51 miles; Edrisi, 47½.

Salmas is four caravan days to the SW. of Tabriz,

according to Tavernier. Kawi, or Koi, is said by Abulfeda to be 21 A. miles, or 22¼ Geogr., from Salmas towards Barghiri. Edrisi says 27 A. miles, or 28½ Geogr.: and Barghiri, 90 A. miles, or 95¼ Geogr., from Koi, by the accounts of both these geographers. If, then, we adopt the 22¼ of Abulfeda, we have a line of 153 A. miles, or about 162 Geogr., between Maraga and Barghiri, which is the distance, within a fraction, found on the construction. If Edrisi's 28½ are adopted, they would fall near 6 miles beyond, and the mean of both, about 3.

Thus we have completed the line from Kaswin to Trabezon, of which the last portion, between Maraga and Barghiri, is the least satisfactory; but we have no reason to question the other parts, because they are checked by cross lines of distance; the one from Diyarbekir to Barghiri; another from Dainawar to Maraga; and a third from Hamadan to Zengan.

SECTION VII.

Connection of Kaswin, Erzerûm, and Trabezon, with the Russian frontier, Derbend, and other positions, on the west side of the Caspian Sea, and on the east of the Euxine.

This very extensive tract embraces a vast variety of matter, without any observation of longitude, for about 10 degrees, between Kaswin and Trabezon, or

for $6\frac{1}{2}$ degrees of latitude, between Maraga and Mosdok. Moreover, the new Russian map of 1800 ceases to be accurate beyond the southern boundary of that vast empire, the rivers Terek and Kuban. Mosdok presents a point fixed by celestial observation, in the midst of this boundary, and we conclude, that the boundary on either side of it has been carefully surveyed, and that the positions in it may be taken for granted. We have accordingly adopted that of the mouth of the Sulak river, at the shore of the Caspian Sea; and again, on the other side, that of Anarghia, on the shore of the Black Sea, with Kutais, the capital of Imariti, in the interior. And hence the line of boundary, of the matter copied from the Russian map, runs from Anarghia, on the west, through Kutais, to Mozdok, and thence to the mouth of the river Sulak, at the Caspian Sea. To the south of this line, all the matter borrowed from the Russian map (which has been pretty general, as far as the mouth of the Kur river, on the one hand, and that of the Shorak on the other,) has been new modelled, both in bearing and distance. For instance, we have placed Teflis 26 G. miles, or more, to the NE. of the position in which it stands, in respect of Mosdok, in the Russian map, and the island Kura, on the coast of Gilan, no less than 63! Many other examples are given in a note [1], by which, and by the Map No. IX., the reader may perceive

[1] Irwân about 30 G. miles too far to the west; Akalzike and Kars much the same; Baku, 33; Nakjiwan, 47; Zuat much the same.

that there are errors in the bearing, of a magnitude from $6\frac{1}{2}^{\circ}$ to 10°, possibly through the omission of allowing the variation of the compass. Had the map been extended southward to Kaswin, on the same principle, that place would have been more than a degree and a half to the westward of the position assigned it by M. de Beauchamp's observation, Tabriz, which according to Chardin, is 40 leagues from the sea, would have been within 8 or 10, and the environs of Ardebil would have bordered on the Caspian.

The connection of the above places is effected by the following means:—1. From the line of distance between Kaswin and Maraga (p. 21), as a base, Ardebil and Tabriz are determined, by lines of distance, in the nature of triangles, aided by the latitudes of those places. 2. From Tabriz and Erzerum, as the ends of a base, Irwân is in like manner determined; checked by the *approximated* latitude. 3. From Irwân, Erzerum, and Trabezon, Teflis is determined, by lines of distance, forming two distinct triangles, of which Teflis is at the apex common to both. Teflis is then connected with Mosdok, on the Russian frontier, (a place of observation,) by means of a line of bearing and distance. 4. Reshd, a position in Gilan, near the SW. angle of the Caspian Sea, by bearing from Kaswin, and latitude by European observations; as also its longitude by the Oriental Tables. 5. Zuat, a useful position, at the conflux of the rivers Arash and Kur (Araxes and Cyrus), by lines of distance from Ardebil and Reshd, and by bearing from the latter; also its latitude by

Olearius. 6. Baku ; and 7. Derbend, on the western coast of the Caspian Sea, by latitudes, lines of distance, and some bearings. All of these will be discussed in the order above given, as they progressively furnish the means to each other.

1. Ardebil and Tabriz.

The position of Kaswin, Zengan, Miana (or Meyauneh), and Maraga are already fixed, in Section I., as points in the line from Aleppo to Kaswin.

For Ardebil, whose latitude by observation, taken by Olearius, is 38° 5′, the following are the authorities. Della Valle has a line to it from Kaswin of $49\frac{1}{2}$ farsangs, $157\frac{1}{4}$ G. miles, through Kurtzi-Bashi, and Sengoa. On the other side, Edrisi and Ibn Haukel have each 20 farsangs, or $63\frac{1}{2}$ G. miles from Miana, in 37°, to Ardebil. These lines intersect each other, in the parallel of 38° 3′ 30″, and somewhat to the E. of N. from Miana.

Olearius reckoned $33\frac{1}{4}$ farsangs from Ardebil to Zengan ; said to be in latitude 36° 30′. This distance, equal to $105\frac{1}{2}$ G. miles, agrees to the parallel of 38° 5′ (Olearius's observation), when met by Della Valle's line from Kaswin. Thus, the three authorities of Abulfeda, Olearius, and Della Valle, agree amongst themselves, and in no case differ from the parallel assigned more than a minute and a half.

The longitude of Ardebil, arising from this result, is 47° 21′. We have found no direct line of distance to it from Maraga.

Tabriz is said by Tavernier to be 12 farsangs to the west of Ardebil. We are satisfied with this report, but can find no statement of the distance

from any one who travelled it: for those who go to one do not go to the other, in their way into or out of Persia. Nasereddin and Ulegbeg allow half a degree of longitude between them, and they are allowed to be nearly in the same parallel. M. D'Anville allows about 32 G. miles between them.

The latitude of Tabriz is 38°, in Nasereddin, Ulegbeg, and the Ayin Acbaree; 38° 5′ in Bakoui. Abulfeda allows 17 farsangs, or 54 G. miles, between Maraga and Tabriz. Chardin has *about* 25 farsangs, or 79½ G. miles between it and Miana. These distances, with the 12 farsangs, or 38 G. miles from Ardebil, would carry Tabriz up to 38° 15′ or 16′, which appears out of rule. We have, therefore, taken the parallel of 38° 12 ; reducing the 54 from Maraga to 52½, and the 79½ to 75½; and in this position, it stands in longitude 46° 32′ 30″.

The Oriental Tables give for Tabriz 82°, or 3° W. of Kaswin; that is, 46° 33′, which shews, at least, that they are often right.

2. Irwân, vulgarly Erivan.

This place is determined by two lines of distance, drawn from Tabriz and Erzerum; the intersection being also checked by the *approximated* latitude; for this is not exactly known, and is differently reported, from 40° 5′ to 40° 15′. M. D'Anville took it at 40° 5′; the new Russian map has 40° 9′. We have taken 40° 10′ 30″.

The distance of Irwân from Tabriz is given by Chardin at 52 *leagues*. If these are meant for Persian farsangs, they would produce 165 G. miles;

but this is highly improbable, because it would carry Irwân up to 40° 30′, or within 78 miles of Teflis, which is known to be 48 hours to the north of Irwân.

But the greatest part of this line goes through Armenia, and therefore the Persian farsang cannot be looked for here. Chardin, indeed, says they are leagues of 5000 paces each, and which, if paces of five feet are meant, would be out of all rule. Between Irwân and Teflis, Chardin's league is a caravan hour; for Thevenot reckoned 48 hours; Chardin as many leagues.

Tavernier reckons it 10 caravan journeys from Tabriz to Irwân. The nature of this caravan is not known, but if it is partly made up of camels, 15 to 16 G. miles is sufficient, as we have seen; and then 150 to 160 would be the distance, but even this approaches too near to Teflis.

Nakjiwan is a town said to lie exactly midway between Tabriz and Irwân. Mildenhall came to it from Wan in 6 days, for which 102 G. miles may be allowed, at the same rate as on the former part of his journey from Diyarbekir. Nakjiwan will then be so nearly in the line, between Tabriz and Irwân, that little deduction will be required from the distance, taken on a straight line.

The distance between Erzerum and Irwân is thus obtained. Tavernier states it to be 12 caravan days to the *Three Churches*[1], and these, according

[1] Called by the Armenians, "Etchmiadzin."

to Tournefort, are 3 hours (say 7 G. miles) short of Irwân. Taking the caravan days at 15, we have 187 G. miles between Erzerum and Irwân: and the same number of days is also given by Emin the Georgian, who had travelled between them repeatedly.

M. Tournefort went in a small party, on horseback, from Erzerum to Kars, and thence to Teflis. From Teflis to Irwân: and thence back to Erzerum, through Kars, by the way he came, and in the same mode: but from Teflis to Irwân he went in a caravan.

From his Journal may be collected, that he was, at a mean, out and home, between Erzerum and Kars, 44½ hours; and between Irwân and Kars, on his return, 35 hours more: in all 79½. For the rate, 2·4 appears sufficient, in a very uneven country: and then we have 107 G. miles from Erzerum to Kars; 84, thence to Irwân: total, 191: which allowing 2 or 3 for the angle at Kars, agrees within a mile or two of Tavernier's and Emin's accounts [1].

Kars is thus placed: Its latitude is variously given, from 40° to 40° 40′. M. D'Anville allowed 40° 9′: but from its distance from Akalzike and Ardanutze, it must be much farther to the north [2]. Moreover, its lying in the road, common to Teflis and Irwân, from Erzerum, points to a situation far

[1] M. D'Anville has allowed 173: Green, 181: Senex, 192: mean, 182. The construction has 187.

[2] M. D'Anville supposed it to be 78 G. miles to the southward of Akalzike. The Russian map has 57 only. But we cannot conceive it to be less than 73.

to the north of the line to Irwân. We have taken it at 40° 26′.

If then, in order to place Irwân, the line of 187 miles from Erzerum be met by one of 150 from Tabriz, the intersection will take place in latitude 40° 16′, which yet appears to be too high a parallel, considering the Russian report of 40° 9′; and the interval between it and Teflis: and yet we have taken the distance from Tabriz, at the lowest rate. But it must be taken into the account, that the materials are of a coarse kind: and that the *fractions of days* are almost always neglected: a large fraction being taken for a whole day; and a small one sunk, in the whole days. As the reason of the thing does not admit of a higher parallel than 40° 10′ 30″, (and possibly it may be still lower,) the distance from Erzerum to that parallel will not admit of a greater spacebetween Tabriz and Irwân than 144 G. miles, or 145 through Nakjiwan; which is no more than 14½ G. miles for each caravan day. If Tabriz be in 38° only, as Nasereddin and Ulegbeg state, the distance would, indeed, be 154; but the latitudes given for Maraga and Miana, will not admit of it.

That the parallel of Irwân has not been greatly mistaken, seems to be shewn by the space allowed by Ibrahim Effendi, between Barghiri and Irwân; for he allows 120 G. miles through Bayazid, and our construction 113. Its longitude, fixed as above, is 44° 49′. It does not appear in the Oriental Tables; but Ibrahim places it at 3° 32′ west of the meridian of Astrakan, which being on our construction in 48° 3′ by the Russian observations, the difference of

longitude will, of course, be 3° 14′; or only 18 minutes different from Ibrahim [1].

3. Teflis, from Irwân, Kars, and Trabezon.

It must have appeared to the reader, that the distances between Erzerum, Kars, and Irwân, are not accurate enough in point of scale, or bearing, to be relied on as a base for the determination of Teflis; wherefore it will be necessary to combine them with others from the quarter of Trabezon, &c.; and also from the side of the Caspian Sea.

It must of necessity, therefore, happen, that the discussion of this single point will require much time and patience; and it cannot well be passed over, because the position of Teflis, in the new Russian map, appears to be very different from that given by the routes of travellers: and it is of considerable importance, as it influences the distribution of the whole space between the Euxine and Caspian Seas. We shall begin, by stating generally, the result of the triangle formed by Kars, Irwân, and Teflis; and of which, the space between the two former serves as a base.

Tournefort and Chardin allow 48 hours (or leagues) between Irwân and Teflis, with a caravan. Perhaps

[1] It is remarkable that the longitude of Astrakan should have been better known to the Arabians and Turks than to Europeans, even so late as 1729, when Ibrahim Effendi made his map of Persia, the Caspian Sea, &c. He places Astrakan at 1° 12′ west of Kaswin, which he also places in 49° 59′, that is, only 26 min. to the east of M. de Beauchamp's observations. But, in fact, as the true longitude of Kaswin is 49° 35′, Ibrahim may be said to have erred no more than 18 min., since Astrakan is really in 48° 3′, and 1° 12′ west of Kaswin is 48° 21′.

there is scarcely any tract in which the road is more uneven than throughout nearly one half of this route, which crosses the great belt of mountains that separates Georgia (or Gurgistan) from Armenia. Accordingly, 2 miles per hour seems sufficient; or, which is nearly the same, 97 G. miles for the whole line.

From Kars to Teflis, Tournefort went (as we have said before) with a party, on horseback. Here, therefore, the same rate should have been allowed, as from Erzerum to Kars: but having an opportunity of tracing the route on the Russian map, it is found to go very circuitously, crossing the Kzia river to the south of Teflis, although the remainder of the road goes NE. Moreover, it crosses the same belt of mountains as the road between Teflis and Irwân; wherefore 2·1 is thought a sufficient rate, and 55 hours, the time on the road, will give $115\frac{1}{2}$ G. miles between Kars and Teflis.

The meeting of the two lines just described is in lat. 41° 47′ 30″; long. 44° 47′ 30″; which is almost due north from Irwân, as the Russian map describes, although it assigns a different meridian and parallels to both. For it bears on the construction S. 20 E. distant $121\frac{3}{4}$ G. miles from Mosdok; but on the Russian map S. 10 E. 134, and in lat. 41° 29′, which is $18\frac{1}{2}$ minutes to the southward of ours.

Since the Russian map is a document of such high authority, it is reasonable that we should exhibit some very solid reasons for presuming to differ so widely from it. But perhaps the best way of accounting for the difference, is, that no part of the

map beyond the proper Russian frontier has been compiled from actual surveys and celestial observations.

Guldenstadt has placed Teflis in lat. 41° 54′, and at 115 G. miles only, on a course of S. 7 E. from Mosdok. So that his distance is shorter than ours by $6\frac{3}{4}$ miles; but then his bearing approaches much nearer to the Russians than to ours. It was, therefore, most probably placed on very slight authority. We shall reserve our further remarks and mode of accounting for the difference, until the whole of the question has been examined; and therefore proceed to trace the line of distance from Trabezon, eastward to Teflis, through Goniah and Akalzike.

We cannot be too thankful to M. de Beauchamp for his observation for the longitude at Trabezon; but we are still farther indebted for the distance from thence to Goniah. This is given by the Turkish mariners, at 130 of their miles, which are stated roundly at the proportion of 100 to a degree of latitude [1], so that 78 G. miles is the result.

If the windings of the coast are taken into the account, the direct distance would probably be no more than 75, or, strictly, $74\frac{3}{4}$; and this distance we have adopted as the best information that we have been able to obtain.

For the parallel of Goniah 41° 24′ is taken. The Russians have 41° 20′, and Guldenstadt goes so high as 41° 34′. Here it is proper to remark that the mouth of the *Phasis* is taken at 42° 4′, or 40

[1] However, on a comparison of 900 of these miles, as given by M. de Beauchamp, along the southern coast of the Black Sea, the mean appeared to be 87 to a degree, agreeing to the werst.

minutes N. of Goniah, which is the distance allowed by Chardin, and which is almost entirely difference of latitude.

The Russians place Poti at the mouth of the *Phasis*, in 42° 10′, so that they allow 53 between Goniah and Poti, which is different from all other reports; 40 to 45 being the highest; the Turks allowing 70 to 75 of their miles. But the Russian chart of the Black Sea has no more than 54 G. miles between Trabezon and Goniah.

It may here be remarked, that Anarghia, which is, according to Chardin, 36 G. miles to the northward of the *Phasis*, agrees with our construction in point of latitude and longitude: so that our construction terminates at that point, as coinciding with the Russian grand map of 1800.

Goniah (which is the ancient *Apsarus)* being thus established, we proceed eastward towards Teflis. Chardin gives the following distances:—

From Goniah to Akalzike, crossing obliquely the great chain of mountains between Armenia and Imariti	41 leagues, about E. by N.
Thence to Suram	14 ditto, NE. easterly.
Gori	10 ditto, ENE.
Teflis	13 ditto, ESE. southerly.
	78

These general bearings are arranged by a combination of authorities of various descriptions, and a reference to the Russian and other maps [1]; an ar-

[1] That is, the former being corrected in bearing, by the difference stated in page 132.

rangement too tedious to be described. More light will be thrown on the line of direction, in the sequel, by a reference to the position of Kutais, a fixed point in the Russian maps.

As to the scale of Chardin's *leagues*, (since Persian farsangs are totally out of the question here), it is highly probable that hours are intended, as between Teflis and Irwân, where we have a proof of it, by Chardin reckoning 48 *leagues*, and Tournefort as many *hours*.

From Goniah to Akalzike, the 41 leagues, or rather hours, for which 2·35 might be allowed over ordinary ground, are reduced in rate to 2·2, because of the long course of mountainous road described in Chardin. Of course, 90 G. miles will be the result. The latitude of Akalzike appears to be 41° 38′; for it is said to be 26 leagues from Kutais (Peyssonnel), and by Chardin, 2 *long* days; 50 G. miles may, therefore, be amply sufficient for the distance[1]. Accordingly, Akalzike is placed on these authorities.

The journey of 37 hours between Akalzike and Teflis is broken into three distinct lines of distance, in directions from NE. to ESE. (See page 134.) The two first of 24 hours reach to Gori; 13 hours to the WNW. of Teflis, and 42 to the E. by S. of Kutais. Gori is accordingly placed at 29½ G. miles from Teflis, WNW., and 56½ between the NE. and ENE. from Akalzike; being the respective proportions at 2·35 per hour; but reduced to one straight

[1] Guldenstadt allows 49; the Russian map 41; and M. D'Anville 53.

line, no more than 79½, between Akalzike and Teflis. To which if 90 be added, there will be one line of 169½ between Goniah and Teflis[1].

The 42 hours between Gori and Kutais, (or 55 from Teflis), would give about 99 G. miles on ordinary ground, reckoning at 2·35 rate; but the interval is no more than 88 on the construction, or at the rate of nearly 2·1 only. Nor is it improbable: for two-thirds of the way is entirely through mountains, which are lateral ridges of Caucasus, pointing to the south.

Kutais, as we have mentioned before, is adopted, in position, from the Russian map; and agrees well with the distance from Kobolat, a place situated on the coast of the Black Sea, 15 G. miles to the NNE. of Goniah; from whence it is 58½ G. miles to Kutais, or about 73 from Goniah, NE. In the Theodosian Tables, *Caspiæ* is certainly intended for *Cyta*, or Kutais, 140 MP. from *Sebastopolis* (Iskuriah), or 100 G. miles. The agreement is very close, and seems to prove at once that *Cyta* was the place intended; and that Kutais is rightly placed in respect of Iskuriah.

The Russian map allows about 78½ G. miles between Anarghia on the coast of the Black Sea and Kutais, which distance we have adopted, as it appears to be just. To these, if 88 be added (as above) to Gori, and 29½ thence to Teflis, there will be an aggregate of 196 G. miles, or allowing 1 mile for the angle at Gori, &c. 195, between Anarghia and Teflis, whilst the distance from Goniah is 169½.

[1] The new Russian map allows exactly the same distance.

It is, in truth, very remarkable, that the two lines of distance just mentioned should be found to agree within a mile or two of the result of the triangle from Kars and Irwân; but the fact is certainly so.

Having completed the lines to Teflis from the south, the SW., and the west, a few remarks will be proper in this place; for the line to be traced, hereafter, from Zuat, on the SE. is rather to be considered as agreeing generally with the former results, than as ascertaining a fact.

It has been remarked, (page 124), that Teflis, in the Russian map, is 26 G. miles to the southwest of the position which we assign it; and the authorities have been detailed to the reader, (page 132.) Now, although there is so great a difference between us in the absolute position of Teflis, yet we agree exactly in the distance, at which Teflis stands to the eastward of Goniah; but Goniah is placed too near to Trabezon by about 21 miles, being only 54 in the Russian map; on ours $74\frac{3}{4}$. Nor can there be a doubt concerning the latter interval, since the Turkish navigators reckon it 130 of their miles, which are of 100 to a degree, according to M. de Beauchamp. This, then, appears to be one source of error in that map.

A second source of error appears to be the omission of making due allowance for the variation of the compass, which is here probably 6 to 7 degrees to the W. of north; for it was $8\frac{1}{4}$ degrees at the east end of the Black Sea in 1797, and in the Caspian 8 or 9 in 1746. Now the difference in the bearing is gene-

rally 6 or 7 degrees at the Caspian Sea; but no less than 10 between Mosdok and Teflis. And the differences are all *the same way;* that is, too far to the west of south, or east of north; the effect that the adoption of the *magnetic,* instead of the *true,* meridian, would have. And, finally, as would also happen, in such a case, the more remote the greater the error; as, for instance, Teflis is upwards of 20 miles too far to the west; Nakjiwan and Shamakhi, more distant, above 40; and the island of Kura, the most distant, upwards of 60. Thus much for the errors occasioned by the bearings.

Teflis, by our construction, stands at 121¾ from Mosdok, but on the Russian, 134. The excess, about 12, may be occasioned by making use of the *road distance* as a *straight line,* instead of allowing for inflexions. Again, it will be found, that between Teflis and Derbend, a still greater proportional excess arises; no less than 17 on 153.

But, whatsoever be the cause of the error, there can be no doubt that all the positions in the Russian map to the south of Mosdok, Sulak, Kutais, and Anarghia, are too much to the westward. And even, far as we may seem to have carried Teflis to the eastward, it may yet be suspected that it lies even still farther to the east, rather than the contrary. For the distance is rather underrated, than otherwise, between Goniah and Teflis; and we have taken Trabezon at several miles farther to the west than M. de Beauchamp's observation. We shall now pursue the enquiry respecting the positions at the

Caspian Sea, and their bearing on the subject of Teflis and Derbend.

4. Kaswin to Reshd.

It happens that there is no line of distance from Ardebil to the side of the Caspian Sea, of such a kind as to check its longitudinal position; nor, indeed, any line from any position between it and Kaswin to the same sea. Hence it follows, that if there be no absolute want of certainty respecting the relative position of the SW. angle of that sea, to Ardebil, &c. yet there is a want of that confidence which a good cross line of distance ensures. It was intended that M. de Beauchamp should have joined the point of Reshd, on the Caspian, to his place of observation, Kaswin, which would have completed his work; which, through the want of such a junction, remains, in a degree, imperfect.

Such being the state of things, the position of Reshd and of the Caspian can only be approximated by the casual reports of travellers, and the doubtful longitude of the Oriental Tables. However, it will appear that the Tables in this instance agree with the distances and bearings given.

All the statements, save one, that have appeared, place Reshd to the E. of N. from Kaswin; the exception is Kempfer's MS. route, which gives N. 25 W. But if that had really been the truth, the Caspian Sea would have approached very much nearer to Ardebil than any one has yet conceived it to do.

These are the different authorities for the bearing of Reshd from Kaswin:

1. M. de Beauchamp	NNE.[1]
2. Mr. Hanway	N. 20 E.
3. Ibrahim Effendi	NE.
4. M. D'Anville	N. 15 E.
5. M. Delisle	N. 30 E.
6. Mr. Green	NNE.
7. Olearius	N. 12 E.
8. The Oriental Tables, which allow a difference of long. of 10 min.	N. $7\frac{1}{2}$ E.[2]
Mean of the whole	N. $21\frac{3}{4}$ E.

Laying out of the question all but those who have been on the spot, that is, Olearius, Beauchamp, and Hanway, we have a mean of N. $18\frac{1}{3}$ E.; and, therefore, one cannot by any means allow the bearing in Kempfer's route of N. 25 W. The Tables also give a bearing to the east of north, although less than any other authority; and one may conceive that Messrs. Delisle and D'Anville, as well as Ibrahim and Green, had some authority for giving easting. The quantity, however, seems to be uncertain; and although it is said in one place that M. de Beauchamp reckoned it NNE., yet in another he is made to say that Reshd lies to the *northward* of Kaswin. Upon the whole, we have taken the least easting; that is, the difference of longitude in the Tables, which gives N. $7\frac{1}{2}$ E. and a long. of 49° 44′. In this position, the nearest part of the Caspian Sea, (that is, the Gulf or Bay of Gilan,) will be 108 G. miles from Tabriz, equal to about 34 farsangs; and Chardin says that the distance is reckoned 40. He was then

[1] In another account, *northerly*.

[2] Under the name of Husum.

speaking of the supply of fish; so that it is probable that the ports of Astara or Lengerkunan might be the points alluded to, and which are rather more distant than the open shore of the Bay of Gilan. Abulfeda, moreover, says that the country of Gilan is in some parts two journeys across, from the sea to the mountains; which seems to require that the road between Ardebil and Kaswin, and which leaves Gilan far to the east, should come no nearer to the Caspian Sea than the construction represents.

Reshd being placed, as above, in 37° 18′, 49° 44′, we proceed northward to Lengerkunan and Zuat.

5. Zuat, or the *passage* at the confluence of the Kur and Arash rivers.

It is necessary to premise that the chart of the Caspian Sea, sent to the Academy Royal of Paris by the Czar Peter, and bearing the name of Vanverden, 1721 [1], describes the western coast of that sea to lie more in the line of the meridian than our construction, determined principally by the two points of Terki and Reshd, will admit.

The longitudes in the Oriental Tables, and in Ibrahim's map, agree with our construction, but disagree with all the former charts, because Astrakan was placed 2 *degrees* too far to the eastward. (See page 131.)

[1] According to the date of Colonel Bruce's expedition to survey the Caspian Sea, which is 1723 in his Memoir, it should have been posterior to the presentation of the map of Vanverden, which bears the date of 1721. One can hardly suppose that *two* such expeditions were made; but it is certain that the chart of Vanverden does not agree with Bruce's descriptions.

Ibrahim allows 1° 23′ for the difference of long. eastward, of Reshd, from Astrakan. The construction has 1° 41′. In the Tables, between Bailakan (in Shamakhy) and Husum (Reshd) 1° 40′; on the construction 1° 30′; and finally, between Reshd and Astrabad, 4° 25′ in the Tables, 4° 19′ on the construction.

Olearius, in his coarse map of the coasts of Mazanderan and Gilan, places Eliesdu at the southern border of the heath of Mugan, N. 27° 30′ W. from Reshd. The same Eliesdu is given at 13 farsangs S. 14 W. from Zuat, in lat. 39° 54′, by the observation of Olearius. The former is N. 20 W. only in Kempfer's MS. map; N. 23 W. in Woodroffe and Elton's [1]; N. 15 W. in Mr. Smirnove's.

The cause of these differences is clearly to be attributed to an error in the depth of the Gulf of Gilan. That is commonly limited to 20 miles westward from Enzelee; but Olearius, who traced it by land, and notes the place from whence the coast turns to the *north*, allows no less than 40, (17 farsangs from Reshd). Woodroffe comes nearest to the truth, both in bearing and description: it will therefore be best to take the *distance* by land from Olearius; and the *form*, from Woodroffe.

Lengerkunan is in latitude 38° 48′ in Mr. Smirnove's chart; in Woodroffe's the same, admitting Astara to be meant for it; as there can scarcely be

[1] That is, made up from Lengerkunan; for Woodroffe's chart does not include Eliesdu; which latter bears 1 degree more to the west of north, than Lengerkunan.

a doubt respecting it. Its distance from Reshd by Olearius, is 37 farsangs, as in the note [1]; and the traverse producing $100\frac{1}{4}$ G. miles on a course of N. $26\frac{1}{2}$ W., warrants the parallel of 38° 48′, above assumed, for Lengerkunan. Thence to Eliesdu, Olearius reckons 10 farsangs, about NE. by N.; so that the two lines of distance make up the bearing of N. $27\frac{1}{2}$ W. to Eliesdu; (Lengerkunan lying only 1° in bearing to the east of the line,) and a distance of 47 farsangs; the first 37 of which were taken at $100\frac{1}{4}$; and the present 10, at 30 G. miles only, (as they coast the shore, which is indented): and hence $130\frac{1}{4}$ will be the distance between Reshd and Eliesdu.

Zuat, the term of this article, being 13 farsangs N. 14 E. from Eliesdu, is then placed at $41\frac{1}{4}$ G. miles from it; and in lat. 39° 54′, by observation. And hence Zuat will be in long. 48° 37′ 30″.

There is a line of distance from Ardebil to Zuat, in the direction of about NNE. $\frac{1}{2}$ E.: and, by the

[1] From Reshd, Olearius went 8 farsangs westward, to Keskar, or Kurab: thence 9 north-westward along the coast, to Sengarhassara; which appears to be near the SW. angle of the Caspian Sea. From thence 7 to Hove-lemur, ENE. in the Journal; but by the chart meant for NNE. Thence to Astara 6 north; and 7 more to Lengerkunan, implied to be the same. Total 37 farsangs, of the long Persian standard.

From Lengerkunan to Eliesdu is 10 more; Kizilgatch lying midway.

The bearing in Kempfer's chart is north, between Hove-lemur and Lengerkunan: from Reshd to Hove-lemur N. 31 W. Or, the whole line from Reshd to Lengerkunan N. 20 W. in Kempfer; N. 25 W. in Olearius; and on the construction N. $26\frac{1}{2}$ W. to Lengerkunan, $27\frac{1}{2}$° to Eliesdu.

way, it affords a comparison with Eliesdu, by means of Barsand, taken for Betzirvan.

There are two sets of authorities for the distance on this line; and a third for the bearing. The first is made up from the Journals of Olearius, Bell, Struys, and Le Brun: for Olearius, who is generally the most attentive and accurate, in all matters relating to geography, has certainly misstated the length of the first day's journey from Zuat; which he gives at *one* farsang, whereas it was probably 5. The general result, in the note, is $39\frac{2}{3}$ farsangs, (which are here of the full Persian standard); or about 126 G. miles.

The second statement is from Abulfeda, and is thus: Ardebil to Kaschan 13 farsangs, Barsand 7: total 20 farsangs, or $63\frac{1}{3}$ G. miles. Barsand, on the construction, is 65 G. miles from Ardebil, which is only $1\frac{1}{2}$ difference. (See No. XI. letter c.)

Olearius, when at Eliesdu, was told that Betzirvan was 6 farsangs from it. This place [1] is in lat. 39° in the Tables, which agrees exactly to Barsand; and which is the Rabatsiwan of Ibrahim, in 38° 50′, 60 G. miles to the southward of Bailacan, which is itself in 39° 50′ in the same Tables. Taking, then, Barsand for Betzirvan, and adding 19 G. miles to the $63\frac{1}{3}$ of Abulfeda, we have $82\frac{1}{2}$ for the distance of Eliesdu from Ardebil: and the construction has actually 86. Of course, Eliesdu may be considered as well placed by the lines from Ardebil and Reshd; and by its known distance of 13 farsangs, or $41\frac{1}{4}$ G. miles from

[1] Under the name of Mukan, or Mugan.

Zuat, in the parallel of 39° 54′. And hence we have also a confirmation of the position of Zuat, placed as before, in long. 48° 37′ 30″. For the difference of $3\frac{1}{2}$ miles are not to be regarded, when such kinds of materials alone are to be had. And it will be found on the construction, that Zuat falls at $124\frac{1}{2}$ G. miles from Ardebil, instead of the 126 given by the Journals; and at N. $12\frac{1}{2}$° E. from Eliesdu, instead of 14°.

The bearing from Ardebil is, at the same time, N. 28° 40′ E.; and Ibrahim Effendi has it at N. 25 E., with a distance of 132 G. miles. This shews that the received opinion of the geographers at Constantinople agrees very nearly with ours; since the difference in the angle of bearing is no more than 3° 40′; and the distance $7\frac{1}{2}$ on 132.

It has been already stated, (page 121,) that Ibrahim allows the same distance that we have done, within 3 miles, on the 421 between Diyarbekir and Zuat[1].

Zuat being placed, it will now be proper to enquire, how far the distances given, between it and Teflis, agree with the space on the construction.

There is a line given, as straight as the general course of the Kur will allow, and which appears to differ but a few miles. It leads from Teflis, through Kanja, Berda, and Bailacan, (which is the same with Karabagh,) to Zuat.

Abulfeda gives 43 farsangs from Teflis to Berda; but although it certainly passes through Kanja, he omits to mention it. Berda, by the same authority,

[1] Ibrahim Effendi also allows 143 G. miles between Merend and Zuat; which is 141 on the construction.

is 2 days, or 38 G. miles from Kanja, so that 12 farsangs (38 G. miles) are to be deducted: and then the 31 will give 98½ for the distance of Kanja from Teflis. Guldenstadt allows 95 for the same interval: Peyssonel 6 caravan days; perhaps 93 to 96. The Russian map allows 102. The mean of the four would be 97½, or within a mile of Abulfeda's report.

Emin states the distance between Kanja and Bailacan to be 6 caravan journeys, which he had himself travelled. These taken at 15½, are 93 G. miles. And between Bailacan and Zuat, M. Delisle allows 19. Total 112 from Kanja to Zuat: to which, if we add the 98½ of Abulfeda, there are 210½ G. miles between Teflis and Zuat, *through* Kanja, Berda, and Bailacan [1].

The space on the construction, between the above points, is 213; or only 2½ more than the sum of the reports [2]: at the same time that the two points of termination of this line are determined by authorities that are totally distinct from each other; as we have seen in the course of the enquiry.

With respect to the principal places situated in this line, the course of the river Kur, which is de-

[1] The Russian map has only 86 between Kanja and Zuat; which we reckon at about 112!

[2] Distances on the construction:

Teflis to Kanja	102	G. miles.
Kanja to Berda	41¾	
To Karabagh, or Bailacan . . .	50¼	
Zuat	19	
Total .	213	

tailed in the new Russian map, determines them generally. Kanja is in lat. 48° 38′; and is distant from Irwân, by the construction, 77¼ G. miles. Zannoni allowed 83.

Berda is 11 or 12 miles to the south of the Kur; and therefore cannot be well more than 40° 17′ in parallel, although given at 40° 30′. The longitude given in the Tables is 2° west of Kaswin, or 47° 33′: on the construction it is 47° 13′.

Karabagh, or Bailacan, given at 39° 50′ latitude, ought to be in 40°; being to the N. of Zuat, which is in 39° 54′. Its longitude given is 1° 30′ W. of Kaswin, or 48° 3′: on the construction, 48° 13′. Thus, by the difference of longitude, Bailacan would be 26½ G. miles from Zuat, towards Teflis, whilst 19 are allowed.

The Russian map is exceedingly faulty between Kanja and Zuat: it allows no more than 86 G. miles between these places; which are doubtless 112 asunder: and Zuat is more than 48 miles too far to the west, in respect of Irwân and Teflis.

In effect, then, Teflis, by the reported distance from the side of Zuat, on the south-east, ought to preserve the general situation in which it is placed, by the authorities, from the south and west. For the reports from Zuat, if reduced to a right line, would be 205½ G. miles; and the construction has 208¼; by which it would come more to the east, rather than to the side on which the Russian accounts have placed it.

6. Baku, at the Caspian Sea.

Lengerkunan has been placed in the course of

this enquiry, page 143. It is situated on the open coast of the Caspian, just without the mouth of the gulf of Kizilgatch, (the estuary of the ancient *Araxes*, whilst it held a course separate from the Kur, or *Cyrus*.) In the construction, it serves for a point of comparison between the several charts of the Czar, Woodroffe, Smirnove, and Olearius. According to the above determination, it stands in lat. 38° 48′ [1], long. 48° 47′ 30″; being N. 26½ W. 100¼ G. miles from Reshd.

On this position of Lengerkunan depends the adjustment of the western side of the Caspian Sea, and the position of its coasts, between Baku and Reshd.

The bearing of Baku from Lengerkunan is thus given in three different charts:

The Czar's	N. 32° E.
Mr. Smirnove's	N. 29½ E.
Woodroffe's	N. 35 E.

But it appears from Woodroffe's chart, that he had very little knowledge concerning this part; and moreover, Astara being written for Lengerkunan, it may be better to lay his bearing out of the question. The mean of the other two is N. 30¾ E.; and the distance 103 to 106 G. miles [2].

[1] Woodroffe, 38° 47′ 30″; Czar, 38° 49′; Smirnove, 38° 48′.

[2] Lengerkunan is not actually included in the new Russian map, though only just beyond the border of it: but the bearing from the island of Kura, or Kur, to Baku, is on that map, N. 35 E.; although no more than N. 19 E. in reality. This may serve to shew how very much all those bearings are in excess from the east towards the south; and from the south towards the west. Here is a difference of 16 degrees.

The latitude of Baku is given by Woodroffe's at 40° 17′; by the Czar's, 40° 24′; by Mr. Smirnove's, 40° 25′ 30″; by the new Russian map, 40° 24′; and by the Oriental Tables, 39° 30′, meant for 40° 30′. We have adopted 40° 20′, as being nearly a mean between Woodroffe and the Russian maps. The bearing is taken at N. 28½ E.; which is 1 degree to the northward of the northernmost, 2¼° to the northward of the mean: and the reason is, because it will appear that Baku and the point of Absharon would be thrown too far to the east, in respect of Derbend and Sulak. At the same time the 2¼° make no more difference of easting, on 106 miles, than about 5 miles.

The above bearing of N. 28½ E. produced to the parallel of 40° 20′, will place Baku in longitude 49° 53′ 15″.

The longitude of Baku in the Oriental Tables, is 84° 30′, or only 30° west of Kaswin: that is 49° 3′. Probably the degree should have been 85° 30′; or 50° 3′, which would have been right, within 10 min. And it probably was so, originally; as Bailacan is in 83° 30′; and is 1° 45′ to the west of Baku.

7. Derbend, and the western coast of the Caspian Sea.

It has appeared, that all the positions in this quarter are too far to the west, in respect of Mosdok and Trabezon. And hence, as we have been compelled to place Baku about 33 G. miles more to the east, than the *Russian* Baku, whilst Sulak, and the positions to the northward of it, preserve their relative position to Mosdok; it is obvious that an alteration of the

bearing of the coast, adapted to the occasion, must necessarily take place. And this difference, between the mouth of Sulak river, and the position of Baku, is equal to about $6\frac{1}{2}$ degrees, more to the eastward of south.

It has been remarked in page 138, that the distance of Teflis from Mosdok exceeded, in so great a measure, the allotted interval on the construction, that the most probable mode of accounting for it was by supposing that a proper allowance had not been made for the inflexions of the road. A like excess, or more, appears in the distance between Teflis and Derbend, in the Russian map: for when Derbend is placed according to the corrected bearing, and in its proper latitude; the distance between it and Teflis will be just that which remains, after deducting *one ninth part* for inflexions: the original being 153, and the corrected, 136 G. miles. The parallel of Derbend is 42° 6′ in the Russian map; and the longitude by our assumed position, 47° 56′ 15″: in the original 47° 41′ 35″[1].

With the like correction in bearing, Niasabad and the mountain of Barmak are placed, on the same coast. These are two geographical positions, which serve as points of outset: the former for a line of distance to Shamakhy: the latter, the point of outset for Olearius, for the same place. The detail of the coast, as well as of the interior, is entirely from

[1] The difference is no more than 11 G. miles in easting, because in the correction Teflis is carried more to the east, in respect of Mosdok, than Derbend, in respect of Sulak.

the new Russian map: some small alterations alone, in and about the Peninsula of Absharon.

The original bearing in the Russian map, from Sulak river mouth, in lat. 43° 19′; long. 47° 3′ 45″; to Baku, is S. 28° 30′ E.: Woodroffe has S. 27° 30′ E.; Mr. Smirnove's, S. 26° 45′ E.; Dr. Rogerson's, S. 24 E.; and the Czar's, S. 24 E.; whilst ours is S. 35 E.; and consequently this has a greater obliquity to the east of south, than the new Russian map, by $6\frac{1}{2}$ degrees [1], increasing the difference of longitude by about 42 minutes. Had the most easterly bearing from Lengerkunan been adopted, it would have increased it to $47\frac{1}{2}$.

As this article concludes the final consideration of the subject of the Russian map, it will be proper to say a word more respecting it; and to enquire what would be the probable result, had the map been continued southward to Kaswin?

Kur Island, in the Russian map, is in long. 47° 57′ 45″. In the charts of Woodroffe, Smirnove, and the Czar, it is, at a mean, 7 min. to the eastward of the meridian of Enzellee; but on our construction 13 min. to the west of it: or in long. 49° 31′. But by the Russian map, it would be in 48° 11′; and Kaswin in 48° 13′; which is in 49° 33′ by M. de Beauchamp's observation. Can any clearer proof be wanted,

[1] Between Sulak and Derbend; Russ. S. 20 E.; Woodroffe, S. 29 E.; Smirn. S. 17 E.; Rogerson, S. $18\frac{1}{2}$ E.; on the construction, S. $26\frac{1}{2}$ E.

Between Derbend and Baku; Russ. S. 34. E.; Woodr. S. 31 E.; Smirn. S. $32\frac{1}{4}$ E.; Rogerson, S. $28\frac{1}{2}$ E; on the construction, S. 40° 15′ E.

that all the positions in that map, to the southward of Mosdok and the Terek river, are too far to the west?

Shamakhy is thus placed: Olearius reckoned it 13 farsangs to the north of Zuat, 20 from Derbend; south; and 13 from Barmak, through Pyrmaras; which is 3 farsangs to the eastward of it. Colonel Bruce says that it is three journeys from Baku. Olearius places it in 40° 40′ lat.; but by the above authorities, it falls in 40° 35′.

CHAPTER III.

THE EASTERN QUARTER.

SECTION VIII.

Connection of Kaswin and Ispahan.

KASWIN and Ispahan are both determined by the observations of M. de Beauchamp; whose labours have enriched geography from the shores of the *Propontis* to the Caspian Sea, and the heart of Persia. The latitude of Kaswin is 36° 11′; and long. 49° 33′: Ispahan 32° 24′ 30″; and 51° 50″. Accordingly, Ispahan bears from Kaswin SSE. $\frac{1}{2}$ E. nearly; distant 252 G. miles.

The Oriental Tables place Kaswin in 85° east from the Fortunate Islands; and Ispahan 86° 40′; thus allowing only 1° 40′ difference of longitude between them; whilst the European observations make 2° 17′. But the same Tables allow 14° 30′ between Aleppo and Ispahan, whilst the European observations give 14° 41′; or only 11 min. difference [1].

[1] The longitude of Aleppo in Nasereddin and Ulegbeg's Tables is 72° 10′ E. from the Fortunate Islands.

Kaswin . . .	85° 0′	
	12° 50′	
Aleppo, *Con. des T.*	37° 9′	Diff. 26 min.
Kaswin . . .	49° 33′	
	12° 24′	

A MS. map in the British Museum (appearing to be Kempfer's) on a scale of about $6\frac{3}{4}$ inches to a degree, contains the roads, generally, between Derbend and Ispahan. It has parallels of latitude drawn on it, which serve to mark the line of direction; but these, as well in respect of place, as of direction, appear to be often erroneous. Ispahan, for instance, is placed in 31° 54′ lat.: or half of a degree too far to the south: and the bearing differs 11° 30′ from that arising from M. de Beauchamp's difference of longitude, which is S. 26° 20′ E. Kempfer's S. 14° 50′ E. The variation ought, of course, to have been allowed, before parallels were drawn; and latitude assigned. What the variation might be, in Kempfer's time, 1684, we know not: but in 1637-8, it was 17° westerly at Ispahan (Olearius).

The scale is formed, on a *mean* of the whole distance taken between the two places of celestial observation; measured through the points of Sava, Kûm, Kashan, &c. And the aggregate sum of the distance, thus measured, is about 267 G. miles; equal to nearly 83 farsangs, (at the rate of 3 Arabic miles each); which is almost exactly the mean distance, allowed by travellers: the highest being 84, the lowest 81. The Oriental geographers also allow 80, roundly.

Thus, it appears, that the observations are perfectly in harmony with each other; and that the received opinions of persons on the spot agree both with the observations, and the reports of the distance.

Here follows a Table of the reports of the distances, by different persons:—

Lines of distance.	Olearius.	Chardin.	Della Valle.	Abulfeda.	Bell.	Malcolm. Original Bearing.	Mean.	Kempfer. Original Bearing.	Prop. Dis.	Adopted Bearings.	Prop. Dis.	Prop. Fars.
									G. M.		G. M.	
Kaswin to Sava . . .	25	25	24½	.	.	. . . .	24¾	S. 0° 30′ E.	63¾	S. 11 E.	77¾	24
Sava to Kûm	11¼	11	.	12	.	. . . .	11½	E. 39° 30′ S.	39½	E. 23½ S.	38¾	12
Kûm to Kashan . . .	17	16	.	16	17	S. 34 E. 17¼	16½	S. 32° E.	53½	S. 40½ E.	54¼	17
Kashan to Ispahan .	.	29	.	.	31	S. 16½ E. 29¾	30	S. 3° E.	110	S. 15·25 E.	95¾	29¾
							82¾		266¾		266¾	82¾

Latitudes by Observation.

Kaswin . . .	36° 11′	M. de Beauchamp.
Sava	34° 56′	Olearius.
Kûm	34° 39′	Malcolm.
Kashan Bagifica Town	33° 57′	Malcolm.
	33° 51′	Olearius.
Ispahan . . .	32° 24½′	Beauchamp.
	32° 26′	Olearius.
	32° 25′	Orient. Table.
	32° 38′	Malcolm.

Longitudes.

Kaswin .	49° 33′	Beauchamp.
	49° 59′	Orient. Tab.
Ispahan .	51° 50′	ditto.
	51° 56′	Malcolm.
	51° 40′	Orient. Tab.

The mode in which Kempfer's route has been corrected, and applied, is this: Where the latitude was taken by observation, the parallel of the place was preserved as nearly as possible; and the *mean* distance from the last place, laid off to it: the mean distance being always adopted, even in preference to the *corrected* bearing. It will be observed by the Table, that when Malcolm's route went over the same ground with Kempfer's, the corrected bearing and Malcolm's agreed generally. Nothing more need be said respecting the mode of construction.

It was of considerable importance, that the three points of Kûm, Sava, and Kashan, should be satisfactorily placed, as being points of outset to Hamadan, Tehran, and the Caspian Strait. And between Sava and Kaswin, arise two other important stations; Segsabad and Koushkara, where lines of distance between Hamadan and Tehran cross the road.

With respect to the map of Kempfer, notwithstanding its defects, it has proved a most valuable document; as it gives not only the inflexions of the road, but also the mountains, and other objects, by the way: and although the portions of distance are, in some cases, estimated widely from the just proportion, yet by the aid of observations of latitude, and the reports of the distance from so many different persons, it has been rendered almost as useful as if the scale had been correct.

The context of this geography was formed, previous to our receiving, by the favour of Captain Warren (of His Majesty's 33d regiment), a sketch of Colonel Malcolm's route from Bushire to Tehran, and Bagdad. So that the latitudes, and the *distances*, on

this route, but without bearings, were all that the author derived any advantage from in this quarter: for the positions of Tehran, Kûm, and all the positions along the Caspian, had been determined, previous to the arrival of the sketch.

But it gave the author much consolation to find, that the map, so obligingly sent by Captain Warren, places Tehran no more than 19 G. miles further to the east of Bushire, than the author's: which on so long and so circuitous a trace, he considers as a small difference.

The latitude of Tehran, taken by Colonel Malcolm's party; as well as many other of the latitudes, in his route; and the nice attention shewn to the computation of the distances, have all proved of very great service.

SECTION IX.

The connection of Kaswin, Reshd, and Ispahan, with Tehran, and the positions on the southern coast of the Caspian Sea.

Since the lines of distance from Kaswin to Astrabad (at the SE. corner of the Caspian Sea) are so circuitous; and those from Tehran and Kashan so oblique, it becomes necessary to make use of the distances set forth by mariners and others, for the breadth of the southern part of that sea. One of those mariners, however, was Captain Woodroffe, a

British commander in the merchant service; and one who gave himself to the improvement of hydrography, in those remote regions. A land officer in the service of the Czar Peter, Colonel Peter Bruce, was sent, in 1723, to explore the shores of the Caspian: and for whose itinerary measure of *werst*, we have a scale, in the difference of latitude, between Enzellee and Baku [1].

There are, moreover, land routes, both from European and Asiatic travellers; and particularly from Oriental geographers; and it is not so much the *paucity* of geographical materials, as the want of connection between them, in any one author, that is complained of. For, from matter of this kind, and also the work of different persons, who had different views of the subject, it is often difficult to produce satisfactory results. Moreover, it occasions an infinity of labour and time, to the reader, as well as to the person who has the task of examining and arranging them.

With respect to the Russians, who are masters of this sea, their publications, in later times, have thrown very little light on the hydrography of the *South* Caspian: as witness the chart of the Bay of Ghilan, and the gulf of Balkan; and the position of Baku.

[1] Colonel Bruce reckoned between Reshd and Baku 255 wersts. These, at 87 to a degree, produce 176 G. miles; but on the construction, the interval is 182, or 6 in excess. It may be observed, that, between Enzellee and Astrabad, he was short of the *mean* of the other authorities, in much the same proportion.

The principal of the charts of the Caspian Sea that have been examined, with a view to the improvement of the *southern part* [1], are, 1. That usually called the Czar's, published by M. Delisle, and which has the name of Vanverden to it. 2. A MS. chart communicated by Dr. Rogerson; of the date of 1797. This is said to be a corrected copy of the Czar's; and has a greater number of particulars in it; and is much more correct in the NE. part. 3. The chart of Woodroffe and Elton, published in Mr. Hanway's travels; and (bating what it copies from the Czar's) drawn from materials collected previous to the year 1745. This contains the observations of Captain Woodroffe, during his navigation of this sea: and which, respecting the parts between the mouth of the Kur on the west, and the island of Kulali, on the NE., appears to be the best delineation we have. The same may be said of the coast about Derbend, &c. And, 4. A MS. chart communicated by the author's friend, the Rev. Mr. Smirnove (to whom the present work stands highly indebted, in various ways). The scale of this chart is about $3\frac{1}{2}$ inches to a degree; and is, taken *altogether*, the best that we have seen. To these authorities are to be added, although not in the form of a chart, the report of Colonel Bruce's distances.

The chart of the Czar, or of Vanverden, together with its copy, are too coarse to be relied on in detail; and there is also better authority at hand, amongst those above specified.

[1] In the *northern* part, the new map of Russia is exclusively followed.

Between Enzellee and the *mouth of the Astrabad river*, the distance given is as follows :

By Vanverden	183	G. miles.
Woodroffe	198	
Smirnove	194½	
Bruce (270 wersts to Astrabad bar, at 87° to 1°, are 186; thence 3 to the river's mouth)	189 [1]	
Mean of the four	191	
Mean of three, excluding the Czar's . .	193¾	

These comparisons were made, setting off from Enzellee; as being a point *common to all;* some, not having Reshd; which is a more proper point of outset, as being a fixed point (page 141). But measured from Reshd, the following is the result [2] :

Woodroffe	194	G. miles.
Smirnove	189	
Bruce, reduced to the same point from Enzellee *mouth*	182	
Mean, from Enzellee to the mouth of the Astrabad river	188⅓	

The number adopted is 189 (as Bruce is short of the others, and as the scale between Enzellee and

[1] The *Bar* of *Astrabad* means the bar at the entrance of the *bay*, into which bay the river (which is 3 miles farther to the eastward, reckoned on the line from Enzellee) discharges itself.

[2] Enzellee is the port of Reshd, and its entrance from the Caspian Sea bears N. 21° W. distant 16 G. miles.

Baku seems to require it,) from Reshd to Astrabad river mouth. The city of the same name, is 8 hours' journey from the nearest part of the coast; and may be allowed to increase the distance from Reshd 19 G. miles: consequently, Astrabad should be 208 miles from Reshd, east, a little southerly: its latitude being 36° 50′, by Woodroffe, as well as by Nasereddin and Ulegbeg. And this distance gives a difference of longitude of 4° 18′ 30″, which added to that of Reshd 49° 44′ gives 54° 2′ 30″ for Astrabad. In the Oriental Tables the difference is 4° 35′ E. of Kaswin, in 49° 33′; whence 54° 8′ would be the longitude of Astrabad. And the difference of $5\frac{1}{2}$ minutes is not great, considering the nature of the materials. We have adopted the result of the distance, 54° 2′ 30″.

The next consideration is the distribution of the space, between Reshd and Astrabad, along the south of the Caspian; which is very erroneous in all maps; and in none more than in M. D'Anville's. For instance, Fahrabad, which is well over towards the SE. corner of that sea, is placed by him midway between Reshd and Astrabad. Amol, the principal town in that quarter, is placed nearly $\frac{4}{5}$ of the way from Astrabad towards Reshd, although it is nearest to the former. This latter is the error of M. Delisle. But in fact, the whole suite of positions, in both of the systems of these two great geographers, is very much deranged.

Before we proceed to state in detail the mode of fixing the principal positions along this coast, it will be proper to set forth some fundamental lines of

distance, derived from the charts above-mentioned, collectively.

That part of the coast between Ghilan and Mazanderan has no names of places on it, in any of the charts; a straggling village or two excepted: it being straight, and without ports; and bordered within by the rough mountainous tract of Dilem, the country of the *Mardi* of Alexander. The mouth of the Alham-Rud (or ancient river) is the first place recognisable; as Rudizar and Langarud are the last places in Ghilan. From this Rudizar, at the southernmost mouth of the Sefit-Rud, and $30\frac{1}{2}$ G. miles to the SE. by E. of Reshd, Woodroffe has 82 G. miles, to the entrance of the Alham-Rud; in a direction of about E. by S.; and from Reshd, 111. Smirnove's chart has $113\frac{1}{2}$. It will be found that Mr. Hanway's land route has a general agreement with these measures. The Alham-Rud is 100 G. miles to the westward of Astrabad, (in Woodroffe) and 85 from the entrance of its river: and it has been already stated that the distance *on one line*, between Reshd and Astrabad, is 208: the angle at Alham-Rud occasioning the difference of 3 [1].

It is in the eastern portion of this line, only, that an opportunity offers of comparing the *nautical* with the *land* measures. The principal points to be

	Woodroffe.	Smirnove.	Construction.
[1] From Reshd to the mouth of Alham-Rud river . .	111	$113\frac{1}{2}$	111
From Rudizar to Alham . .	82	—	$84\frac{1}{2}$
Astrabad to Alham-Rud . .	100	—	100
Astrabad river-mouth to Alham-Rud	$84\frac{1}{2}$	82	85

discussed within this space, are, Ashreff palace, Fahrabad, and Mushedfir, on the coast; Amol, Sari, and Balfrosh, inland; though not *far* from the coast.

It is necessary that the latitudes should be spoken of in this place.

In the chart of Vanverden, the latitudes are 11 min. more to the *south*, than Woodroffe's, at the mouth of the Astrabad river; and $5\frac{1}{2}$ at Alham-Rud; but 5 more *northerly* at Sefit-Rud; 4 at Enzellee; and $7\frac{1}{2}$ at the island of Kura. So that the chart of Vanverden represents the south coast of the Caspian to embay more deeply than Woodroffe's. It may be conceived, that Woodroffe and Elton had better opportunities of ascertaining the latitudes; as well as of observing a number of particulars, respecting the coast in general, than the Czar's officers; who came rather under circumstances of hostility; but the former traversed the coast repeatedly, and landed often; and moreover, were at one time in the service of the king of Persia. Another circumstance is, that Woodroffe, in all probability, made use of better instruments, than were invented, or in use in Russia, during the time of the Czar.

The latitudes found in Woodroffe's chart are as follow:

Enzellee . .	37° 33′	I. Kura . . .	38° 59′
Reshd . . .	37° 18′	Fahrabad . .	36° 57′
Alham-Rud .	36° 49′	Astrabad . .	36° 50′
Sefit-Rud mouth	37° 26′	Ditto river-mouth	37° 00′

These are taken from the chart, in Hanway, without knowing in what particular places the observations were taken. It appears that the map commu-

nicated by Mr. Smirnove also carries the southern coast much farther to the south, than Woodroffe; we have, therefore, not to go into extremes, (as it is not known whether Woodroffe took the latitude at Alham-Rud itself,) taken its parallel 3 min. lower than Woodroffe's; that is, in 36° 46′, instead of 49′. Mr. Smirnove's carries it so low as 36° 32′: Vanverden's 36° 44′ 30″. Thus we place Alham-Rud; and at 111 from Reshd, 84½ or 85 from the entrance of the Astrabad river. And this place enables us to fix Amol; which, according to Abulfeda, is 4 farsangs from it, *inland*. The river Alham-Rud runs by it, and its course is northerly; so that Amol and Alham-Rud mouth, may be supposed to lie pretty much N. and S.

The parallel of Amol varies, in the Tables, from 36° 30′ to 36° 35′; but both Nasereddin and Ulegbeg give 36° 35′; which we have followed: and then the 4 farsangs, or 12 miles, will agree nearly to the difference of latitude between Amol and Alham-Rud.

The longitude given for Amol is almost universally 87° 20′; or 2° 20′ E. of Kaswin: that is, from Greenwich 51° 53′: but the mean of all, about 51° 56′; which agrees very well with the assumed position, deduced from Alham-Rud. Abulfeda gives the longitude of the latter at 51° 48′: which also comes very near.

Amol thus placed is 87½ G. miles from Rudizar. Mr. Hanway's journey to it from thence (Vol. I.) seems to prove at least that distance. The name of Amol, in Woodroffe's chart, is, by mistake, placed at Sari.

There is no line of distance from Kaswin, or any other *known* inland position on the west, to Amol: the chain being broken between Kaswin and Deilim.

The next principal position is Sari, or Sariyah, a place of great antiquity [1], as well as Amol: and, like that, depending for its geographical position on the map, on a place 4 farsangs to the northward of it, and on the sea-coast: that is, Fahrabad, at the mouth of the river of the same name. This city was the summer residence of Shah Abbas; and is much spoken of, in the Letters of Della Valle, who resided there a part of one summer.

Fahrabad is thus placed. Ashreff, a palace, at a few miles from Astrabad bay, is 37 G. miles to the westward of Astrabad city, in Woodroffe's chart: and the distance is justified by the two days' journey of Mr. Hanway. Then Fahrabad is 6 leagues to the westward of Ashreff, according to Della Valle, who mentions it twice. These 6 leagues are taken at 17 G. miles; and Fahrabad is accordingly placed at 54 G. miles from Astrabad; and in latitude 36° 57′, as it appears in Woodroffe's chart. It is about 2 miles from the sea shore [2].

Sari is 4 leagues from Fahrabad, higher up the river, which has a *northerly* course: so that Sari must lie nearly south from Fahrabad, and in latitude 36° 45′; or thereabouts [3]; and this position is justi-

[1] Taken for the *Zadracarta* of ancient history.

[2] Ibn Haukel allows 3 days, or 57 G. miles, between Sari and Astrabad, which scarcely differs from our position.

[3] The 4 farsangs may have been reckoned between the *skirts* of the two large cities; and thus, Sari may be 36° 43′ or 44′.

fied, by its being one day's journey from Ashreff, according to Mr. Hanway. The Oriental Tables give for its latitude 37° exactly; all but that, collected by Tavernier; which has 36° 40′. And its longitude is given at 88° generally; or 3° E. of Kaswin (52° 33′): but Ulegbeg has 88° 20′; and Tavernier, 88° 15′; that is, respectively, 52° 53′, and 52° 48′. On the construction, it stands in 52° 52′ 30″.

The space between Sari and Amol, placed as above, is 44¼ G. miles. The authorities for the distance are various and contradictory; being from 44½ to 35. Ibn Haukel allows 14 farsangs; which agrees perfectly. Edrisi, 33 A. miles, or 35 G. Abulfeda, 2 days, 38. Sherefeddin 3 marches of Timur. Herbert went in 4 easy journeys, from Fahrabad to Amol.

It will appear then, that the aggregate distance between Amol and Astrabad, on the construction, is 101¾ G. miles, through Sari and Ashreff; and that the two lines of distance given by Ibn Haukel; that is, 44½ between Amol and Sari; 57 between Sari and Astrabad, make up the sum within a fraction.

It may be conceived, then, that little doubt can be entertained respecting the truth of the general result, of the distances between Reshd and Astrabad; as not only the land and sea reports agree generally, but the astronomical observations in the Eastern Tables agree with both. For if the difference of longitude between Kaswin and Astrabad be taken, it comes within 5 minutes of the distance from Reshd. And the longitudes agree, not only at Astrabad, but at the intermediate points of Amol and Sari.

Another authority, although a slight one, may be adduced. Mr. Hanway (Vol. I. p. 291) says, that the causeway of Shah Abbas extended nearly 300 miles (British of course) from Kesker, to a point, *several leagues* beyond Astrabad. Now, by the straightest line that can be drawn between the positions of Kesker and Astrabad, we have 276 miles; and allowing 4 leagues beyond Astrabad, 288. And this is without any allowance for inflexions; for which the remaining 12 miles are barely sufficient.

Thus we have completed the line of distance from Reshd, to the eastern extremity of the Caspian Sea; and to the extreme point of our work; and it now remains to be enquired, how far the lines from Kaswin to Ispahan agree with the one just completed.

Kaswin and Ispahan, &c., to Tehran, Rey, and Sari.

Tehran, the present capital of the kingdom of Persia, is the first geographical point that presents itself in this enquiry. Mr. Vaughan, who travelled the road himself, reports 33½ hours of camel travelling, between Kaswin and Tehran: and as his rate was 2·166 between Hamadan and Tehran, this road, through a more open country, may add somewhat to it; and 73 G. miles may be allowed. Della Valle's report would not produce more than 70. Herbert's is imperfect. Van Meirop's 115 wersts [1], at 87 to

[1] Mr. Hanway calls these wersts, *miles:* probably the translator of Van Meirop's Journals might call them so. But they

1°, with a deduction for winding, through an open plain, might give 73. So that 73 may be taken.

The latitude of Tehran is 35° 40′, by Colonel Malcolm, and 73 laid off to this parallel give for the longitude of Tehran 50° 56′ [2].

The city of Rey, or Raje (ancient *Rages*), is closely connected with Tehran, in a geographical view. It stood two or three leagues to the SSE. of Tehran, (according to the Castilian ambassadors, in 1403,) because on leaving Tehran for Khowar, the ruins lay on their right hand. The Theodos. Tables have *Tahora* at 10 MP. from *Rages*. Tehran appears to have succeeded to Rey or Rages, as the capital of the province.

The distance of Rey from Kaswin is reported differently by the Oriental geographers; by Abulfeda at 30 farsangs; by Hamdalla 27; by Ibn Haukel 4 days, or 76 G. miles. From Sava, by Edrisi and Ibn Haukel, at 65¾; and 57 G. miles from Kûm. It may be remarked that the T. Tables allow 92 MP. between Sava and Rages, equal to the 65¾ of Edrisi, &c.

To these may be added the reports of the Oriental Tables. They place Rey in lat. 35° 35′: long. 1° 20′ E. of Kaswin. The former being 5 min. S. of

prove themselves to be *wersts*, probably of 87 to a degree, by the ground over which they were traced, the whole way to Nisabour.

[2] In the sketch so obligingly sent by Captain Warren, the longitude of Tehran is 51° 37′. And that of Ispahan, 51° 56′. But we agree as nearly as possible in the different longitudes between Ispahan and Shiraz.

the parallel of Tehran agrees perfectly: and, in fact, corroborates the observation at that place. The longitude 50° 53′, would place Rey 3 min. to the westward of Tehran; but it is known that the contrary is the truth; and that it is somewhat, though but little, to the E. of Tehran. But, in the view of general geography, it rather serves to prove the position of Tehran. And thus, these two positions support each other.

Since the date of the original construction of this part, we have been favoured with Mr. Morier's route from Tehran to Kaswin, which agrees generally.

Previous to our extending the line from Tehran to Sari and Amol, the position of the Strait of Khowar, or *Caspian Strait*, must be fixed.

Della Valle reckoned 29 farsangs (of the long Persian standard) from Kashan to the Strait, (through the Salt Desert); and these were of the scale of 19 to a degree. Of these, the first 20 conducted to Siah-Koh, or the Black Mountain; and are taken at $63\frac{1}{2}$ G. miles. A cross line of distance, from the west, regulates the direction of this line: Edrisi has given the road from Kûm to Rey, in three stations, or journeys, each of 18 Arabic miles. Al Hesn and Dorzah are the intermediate places. From Al Hesn to Siah-Koh, eastward, is a distance of 39 A. miles ($41\frac{1}{4}$ geographic), which, with the $63\frac{1}{2}$ from Kashan, places Siah-Koh. (Kargas-Koh is another mountain in the same desert, lying exactly between Al Hesn and Siah-Koh. This mountain is 12 A. miles from Al Hesn; 21 from Dorzah; 27 from Siah-Koh.)

From Siah-Koh to Mehlbagh (or Salt Town), at the entrance of the Strait of Khowar, is 9 farsangs; making the whole line from Kashan, 29 farsangs; equal to 92 G. miles.

From Tehran and Rey to the strait, the following are the notices:

Van Meirop has about 79 wersts [1], between Tehran and Mehlbagh; for which we allow 50 G. miles; or 123 between Kaswin and Mehlbagh. Strabo allows 500 stades between *Rages* and the *Caspian* strait; which, at 700 to a degree, are equal to about 44 Geogr. miles: and as Rey is *nearer* to the strait than Tehran is, by 4, the 44 may be reckoned 48, in respect of Tehran, and then the two accounts will differ only 2 miles; Strabo's being less than Van Meirop's.

The intersection of the two lines of 50 G. miles from Tehran, and 92 from Kashan, places Mehlbagh, or the entrance of the Strait of Khowar, at about N. by E. $\frac{1}{2}$ E. from Kashan, and nearly ESE. from Kaswin; lat. 35° 22′ 30″; long. 51° 52′.

The Oriental geographers have no route from Rey to the strait, but circuitously, through Khowar city; which is within the mountains. But the latitude and longitude of this place, together with the distance from it to the strait, serves to verify its position.

[1] It is necessary to apprise the reader that he will not find 79 wersts in the Journal, because there is an omission of a stage, between Kebud-Humbed and Evankeef. Sixty-five alone are given, and the other 14 are calculated from the distance on Mr. Hanway's map, between the two stages, above-mentioned.

Khowar is given at 2° 10′ east of Kaswin, or 51° 43′: lat. 35° 40′. Ibn Haukel places it at 2 journeys from Rey; and they agree exactly to the latitude and longitude given.

The Strait, or Al Melh, was said by Edrisi and Ibn Haukel to be 18 A. miles from Khowar, or 19 Geogr.; and that is really the distance on the construction.

The tract of Khowar is a celebrated hunting place of the Persian kings; and is celebrated both in ancient and modern history. Pliny mentions it as a beautiful tract, in *Parthia*, under the name of *Choara*.

Before we quit the neighbourhood of the Caspian Strait, it will be proper to mention Herbert's route to it, from Ispahan. It appears, that he came by a *direct* route, that left Kashan on the west, by 14 or 15 miles; and was perhaps a road made for the purpose of shortening the king's journey through the Salt Desert. It came again into the common road near Siah-Koh. He says that they made a direct north course, as he knew by observing the Pole star, in their night journeys. He reckons 179 miles (meant for British doubtless) from Ispahan to Siah-Koh; whence his mile must exceed the standard by $\frac{1}{8}$; and was perhaps the old English *computed* mile.

Having adjusted the position of the Strait of Khowar, we proceed to Firozkoh, the next step in the line toward Sari.

Firozkoh was a remarkable fortress, situated on the crest of the highest chain of those mountains that shut up the Caspian Sea, on the south; the

Coronus of ancient geography, and now Karen. These mountains divide Irak from Mazanderan: the waters flow from the south of Firuzkoh, through the Strait of Khowar; and perhaps formed it, originally. The descent from Firozkoh towards the Caspian Sea, is said by Della Valle to be twice as much, as the ascent from the side of Irak, or *Media.*

Firuzkoh does not occur either in Abulfeda, Edrisi, or Ibn Haukel; but often in Sherefeddin's History of Timur. That conqueror left it a complete ruin: in which state it was seen by the Castilian ambassadors in 1403; who call it *Periscow.*

Firuzkoh is adjusted in position by a line from Mehlbagh, and another from Tehran; both by Della Valle. The first is of 12 farsangs, the latter of 19, at the former standard: and these meet in lat. 36°, long. 52° 5′ 30″; and at 60 G. miles ENE. from Tehran.

At this place the roads from Ispahan and Tehran to Mazanderan meet; and from thence also branches off a road to Damgan and Korasan, eastward; through Sultan Mydân, a valley formed by the great ridge of Karen, and the outer, and lower ridge, through which the strait passes.

Sari is 18 farsangs, or 57 G. miles from Firozkoh by the report of Della Valle. And this distance will be found to agree with the interval on the construction, Sari being placed in lat. 36° 44′ or 45′; long. 52° 53′: or, taking the whole distance to Fahrabad, in one line of 22 farsangs, equal to 69¾, it equally agrees.

Thus, it appears, that Della Valle's line from

Kashan to Fahrabad, of 63 farsangs, or 200 G. miles, laid off *through* the different points of the route, will not admit the stations on the Caspian Sea to come any farther to the west; and agrees well with the line from Reshd, to Astrabad and Sari.

There is yet another line which appears to verify the position of Sari. Abulfeda says that the distance from Khowar to Sari, is 80 A. miles, 84¾ G. miles; and that is actually the space on the construction, between them, allowing them also to stand in the positions assigned them by the latitudes and longitudes above quoted from the Oriental Tables [1].

The lines of distance from Rey and Tehran to Amol, are very incomplete. Herbert is the only traveller whom we have followed over this ground; and he seems on all occasions to wish to be pompous, rather than accurate and clear.

The interval on the construction between Tehran and Amol is 75 G. miles [2]; and between Rey and Amol, 78. Edrisi seems to contradict himself in pp. 206 and 209; but, on the whole, one would conclude that he meant to allow four stations, or 76 miles, between Rey and Amol; the mountain of Demawend lying midway. Abulfeda only mentions Larryjûn, at 15 farsangs, or 47½ G. miles from Rey, towards Amol. Herbert has 30 of his miles (25½ Geogr.) from Larryjûn to Amol; whence arises a

[1] See above, pages 165 and 171.

[2] The bearing on the construction is E. 48 N.; on Colonel Malcolm's sketch E. 43 N.; 73 G. miles; or only 2 less than ours. Nothing can prove more strongly, that his ideas of the positions on the Caspian are much the same with the author's.

total of 73; or 5 short of the interval on the construction [1].

Herbert also reckons 50 miles from Amol to the mountain of Demawend: for which, the 20 beyond Larryjûn, being so exceedingly rough, and the ascent to the crest of the ridge very great; no more than 14 or 15 G. miles can well be allowed; and then we have 40 for the distance of the mountain from Amol, direct; leaving 35 between it and Tehran, 38 between it and Rey. And Edrisi appears to allow 2 journeys, which amount to the same number of miles.

The sketch of Colonel Malcolm's route places the mountain E. 40° N., 30 G. miles from Tehran. Olivier says 8 or 10 leagues, (Persian farsangs probably). All accounts agree that it lies to the NE. of Rey. The route of Herbert, from the mountain side to Tehran, is not given with sufficient precision to fix the distance. On the whole, we have placed it E. 43½ N. from Tehran; distant 38 G. miles.

The construction of the Caspian provinces, Tehran, &c. was completed before Colonel Malcolm's *sketch* appeared. Had it appeared earlier, we should have lessened the distance of Demawend from Tehran, by a few miles.

There is, however, a remark to be made, which is applicable to the circumstance of guessing the distances of distant mountains, in all places. We are apt to regard the *base*, and not the *summit*; which,

[1] Herbert's miles, in the plains, and even to Firuzkoh, are at the rate of 70½ to a degree, in *direct distance*.

retiring insensibly, eludes the judgment; and the mind dwells on the greater, and nearer mass. And hence, we commonly estimate the distance *less* than it really is. It does not appear that Demawend was *set* from any point *wide* of Tehran. In fact, the line of approach to it, from Ispahan, and that on which Colonel Malcolm left it, were both unfavourable to the base.

Sherefeddin allows 3 marches between Firuzkoh and Demawend; or about 32 G. miles, on ordinary ground: Timur went from Gulkendan, at the southern foot of the mountain. On the construction, it is 30 miles, about W. by N. from Firuzkoh.

Thus we have completed the line from Kashan and Kaswin, to Sari; in which there is no indication of the latter being more to the *west*, than the construction shews: and moreover, it appears to have been the idea of the person who drew the sketch, that Amol bore, within 5 degrees of our statement; and which would produce no more than $6\frac{1}{2}$ miles of difference, in point of position.

Herbert, on the close of his journey to Fahrabad, remarks, that "they made a north course from Ispa-"han, all the way to Fahrabad; as he knew by ob-"serving the Pole star," &c. As far as the Strait of Khowar, this is no doubt just; but how is it to be reconciled, that Sari bears north from the strait, which would place it where Alham-Rud is, and Amol *due north* from Tehran? Why, then, should the road from Amol pass at the very foot of Demawend? and that it does, we learn both from Herbert, and from Edrisi.

The positions of Damgan and Bistam, in respect of the Strait of Khowar, and Sari: serving to corroborate the position of the latter; and to furnish a point of connection with Korasan, &c.

The Mehlbagh of Della Valle at the entrance of the Strait of Khowar, appears to be the *Castellum-al-Melh* of Edrisi, (that is, the Castle of Salt); and Van Meirop noticed what he calls a *rock of salt*, in that situation. The whole soil indeed is salt, as well as the springs; this being a part of the Great Salt Desert, which separates the western provinces of Persia from the eastern.

It is proper to be observed, that although one road from *Media* to *Parthia* and *Asia*, lay through the Caspian Strait, and the mountainous track within it, yet there was another road to the same countries, avoiding the strait, and coasting the south side of the mountains that form it; and which border the Desert, towards the north. But this was destitute of good water: a preference was therefore given to that through the hills, where water and pasturage were to be found, by armies; or by large bodies that could not move with celerity.

In Edrisi, page 208, is a line of distance from Al-Melh, to Damgan, the capital of Kumis (ancient *Hecatompylos)*, through Semnan, coasting the southern foot of the mountains, 96 A. miles, or $101\frac{1}{2}$ Geogr. Van Meirop has, within the same space, 155 wersts, or 95 G. miles. Ibn Haukel allows 5 journeys, equal also to 95 G. miles. And Pliny has

133 MP. between the Caspian Strait and Hecatompylos; equal to 95; which seems to shew clearly that Damgan is on the site of *Hecatompylos* [1].

Edrisi's distance varies too much from the other accounts, and may be laid out of the question.

The two intervals of distance, separated by Semnan, have a general agreement in Ibn Haukel and Van Meirop; that is, the former has 38 and 57 miles; the latter 41 and 54, (that is 67 and 88 wersts): whilst Edrisi has 47½ and 54. Therefore in the first interval, between the strait and Semnan, where he gives 6 more than the highest of the others, we may look for the error.

Damgan, (or Kumis al Damghan,) is given in the Oriental Tables, universally, at 36° 20′ lat., 88° 55′ long., or 3° 55′ east of Kaswin: that is, from Greenwich 53° 28′. The parallel however cannot be rightly given; because Mr. Forster, after going westsoutherly from Damgong, 8 or 9 farsangs, came to the foot of the pass that leads over the Karen mountains (*Coronus*) into Mazanderan; from whence he reckoned 22 farsangs on a NNW. course, to Sari. And as each of these, in the *open country*, was found to be no more than 2½ G. miles *direct* [2], or 55 G. miles for the 22 farsangs, it may be supposed, that the crossing of the wide base of *Coronus*, and the

[1] Strabo, (page 514) has 1960 stadia, but there is little doubt but that the original had 1060; that is, 133 multiplied by 8: 1064.

[2] Mr. Forster's route across Persia was very carefully examined, and compared with the ground; and the rate, on the whole route, found to be 2½ G. miles to a farsang; in *direct* distance.

very rough and intricate ways, through which he afterwards passed *(vide* his Journal), might reduce the whole line to 50: giving 46 min. difference of latitude; and consequently, as Sari cannot be far out of the parallel of 36° 44′ or 45′ (being 4 farsangs to the south of Fahrabad in 36° 57′), Damgan cannot well be to the north of 36 degrees.

If therefore 95 G. miles be laid off to the parallel of 36°, Damgan will fall in longitude 53° 41′; or 13 min. east of the Tables, 53° 28′.

Damgan is situated at the very foot of *Mount Coronus,* and open to the south to the Great Plain, which borders the Salt Desert. It lies on the great road from Kaswin and Mazanderan, to Herat and Balk, (as *Hecatompylos* to *Aria* and *Bactria,* from *Rages* and the country of the *Tapuri);* after the road that led through the Caspian Strait has again entered the plain; and been joined also, by the roads from Amol and Sari. The knowledge of these particulars are owing to Mr. Forster (the traveller overland from India, through Persia), and Van Meirop's Journal in Hanway's travels.

Bistam (or Shah-rud) situated on the same road, is the extreme eastern point of our present work, in this quarter: and it may be best to adjust it *here,* not only as a future point of union, with the second part of the comparative geography; but because its connection with Damgan is intricate; and may be explained with greater facility, whilst the particulars respecting Damgan, and the pass over *Coronus,* are fresh in the memory.

Bistam lies to the E. by N. of Damgan, 30, or

more miles, and at the foot of the same ridge of mountains. It unluckily happens that Mr. Forster did not pass *through* Damgan, having it in view only, at some miles distant to the south; nor did Mr. Van Meirop take any notice of Bistam, although he might have passed through it; and only noted his resting places. But Deymollah, a place 4 farsangs west from Bistam, by Mr. Forster; 33 wersts east from Damgan, by Mr. Van Meirop; furnishes a common point of union to both routes.

From Deymollah, Forster reckoned $16\frac{1}{2}$ farsangs, west, southerly, to Killausir, and Hirroos, two neighbouring villages, from whence he began to ascend the Karen mountains. These, taken at $41\frac{1}{4}$ G. miles, are nearly equal to Van Meirop's 62 wersts between the same Deymollah and Koshaw; that is, 33 to Damgan; 29 to Koshaw: at which last place he remarks, that the road to Mazanderan turned off to the northward, at 59 wersts from Semnan: which agrees with the interval between Semnan and Killausir. So that it may be concluded, that Koshaw and Killausir are opposite to each other, (if not actually on the same road) on the two parallel roads, traced by Forster and Van Meirop. And it would appear, that the road in that part has a bend to the northward; accommodated to the position of the Great Pass, leading from Kumis, or *Parthia Proper*, into Mazanderan, or Taberistan, the country of the *Tapuri*[1].

[1] This appears to be the pass through which Alexander entered the country of the *Tapuri* and *Mardi*, from *Hecatompylos* (Damgan) after he had ascertained the death of Darius.

The 22 farsangs of Mr. Forster, on a NNW. course to Sari, have been already applied to the correction of the parallel of Damgan. But the bearing itself is of the highest value, in this place; as it proves the truth of the relative positions of Sari and Damgan. For after Mr. Forster had arrived at the foot of the pass at Killausir nearly 20 G. miles W. a little S. from Damgan (the position of which he ascertained in passing a few miles to the N. of it), Sari was found to bear about NNW. from him; which is within a degree of the bearing on the construction; arising from positions, determined by authorities, quite independent of each other.

To return to Bistam. This town, placed at 33 wersts and 4 farsangs from Damgan, equal collectively to $30\frac{1}{4}$ G. miles, and in the latitude of 36^{0} 10′, falls in longitude 54^{0} 16′ 45″. In the Oriental Tables, its longitude is 89^{0} 30′; or $4\frac{1}{2}$ degrees east of Kaswin; from Greenwich 53^{0} 3′; so that it is $4\frac{1}{2}$ min. to the east of the Tables; as Damgan was 13.

It may be remarked, that the whole suite of *inland* positions, from Kaswin to Bistam, are too far to the eastward, in respect of the Tables: as

Rey is . . .	4 or 5 minutes;
Semnan . . .	$6\frac{1}{2}$
Damgan . . .	13; and
Bistam . . .	$14\frac{1}{2}$.

Whilst Astrabad on the coast is $5\frac{1}{2}$ to the west.

The Castilian ambassadors returned from Samarkand by the route of Damgan and Semnan. They appear to have made 11 journeys from Damgan to Tehran. The fourth brought them to Semnan: the

seventh to the entrance of the strait; for on that day they passed the Salt Springs, described by Van Meirop, in that situation: the ninth to the site of *Varami* Rey, (*Vatami* in the Journal); where he saw some remains, called Kebud-Humbed. These notices seem to prove that our proportional intervals of distance are right.

SECTION X.

Caspian Sea.

As one of the divisions of this work is appropriated to the subject of the Caspian Sea, the general construction of its hydrography alone will be introduced here. It will be found that its form and position, in respect of the heavens, is very different from former general maps; for it is placed 12 degrees more oblique from the meridian than in M. D'Anville. His may be reckoned 8 degrees to the west of north; the present one, 20.

The materials for this hydrography are of various descriptions and qualities; a great part of which rest on the authority of the Russian astronomers and geographers. The northern coast is determined, in respect of scale and general arrangement, by celestial observations at Astrakan and Gurief; and, in form and distribution of the space, by the new Russian map of 1800. The western coast, as far to the south as the gulf of Agrekan and river Sulak, rests on the

observations at Mosdok. Beyond Sulak, southward, to the gulf of Kesilgatch, the *form* is derived also from the new Russian map, but differently arranged in point of position; in order to accord with the observation of longitude at Kaswin and the inland positions. For the new Russian map describes the western coast to lie so near the meridian from Sulak, southward, that the coast of Ghilan advances westward, *beyond the meridian of Ardebil*, on our construction. And although the longitude of Ardebil may be somewhat more west, yet the state of things in the Russian map cannot possibly exist, unless the observations of M. Beauchamp at Kaswin be faulty; and also that an error in scale runs through the whole series of lines of distance across the continent.

It appears, by what we had occasion to remark on the western side of the Euxine, and in Georgia, that the Russian surveys end, generally, at their proper frontier; and that all beyond is made up from the marches of their detachments, or journals of voyagers. The western coast of the Caspian Sea has accordingly been altered from the Russian map, and a greater obliquity to the east, by $6\frac{1}{2}$ degrees, given to the coast, between Sulak and the point of Absharon. The coast of Ghilan is adapted to this change. Chardin says, that the Caspian Sea is 40 leagues from Tabriz; but the Russian system would bring it within little more than 15.

The eastern side, in respect of general position, is determined by the position of Astrabad, and of Cape Karagan; for the latter being fixed in respect of Agrekan, by the concurrent testimonies of Bruce and

Woodroffe; and Astrabad in the last Section; the direction of the intermediate coast is necessarily fixed. And that direction is 4½ degrees more oblique (to the E. of S.) than Woodroffe's; but less than Rogerson's.

The principal documents used in this construction are:—1. The grand map of Russia in Europe, &c. 1800. 2. The chart of Woodroffe and Elton, in Hanway's Travels. 3. That communicated by the Rev. Mr. Smirnove. 4. That by Dr. Rogerson. 5. The voyage of Colonel Peter Bruce. 6. The travels of Olearius. 7 and 8. Hanway's and Strahlenberg's.

The general positions of the south and west sides of this sea, as far to the north as the Sulak river, having been already fixed, in the Sections VII. and IX. nearly one half of the work of construction is already done. Of the remaining part, the coasts of the whole *northern bason*, from the Sulak river, round by Astrakan and Gurief, to the eastern extremity of the Gulf of Mertvoi, have not only their materials from the new Russian map, but those materials as they really stand in that map. We have only copied, and copied the best.

But between the Mertvoi gulf and Cape Karagan, it became necessary to *lessen* the space, in the same proportion that the space was *increased* between Karagan and Agrekan; as it appeared that a sufficient breadth had not been given to the Caspian Sea in that part. For the Russian maps of latter times have all narrowed this part from 20 to 25 G. miles within the measures given it by Colonel Bruce, and by Woodroffe and Elton; the former of whom was

expressly sent by Peter the Great, to examine the shores of this sea; and the latter had often sailed across it; and the reports of both parties agree within 3 or 4 miles in the breadth of the sea [1]. Here follow the reports of those gentlemen.

Elton and Woodroffe allow on their chart, 150 G. miles between the *town* of *Terki* and the pitch of Cape Karagan. Colonel Bruce says, (p. 324), that the distance is 170 British miles from the *west* point of the Gulf of Agrekan (that of Terki) to the river of Kulala in Turkumania *opposite* to it. These are equal to about 146¾ G. miles. There is no river of Kulala specified in any chart; but as Bruce says in another place (p. 313), that the territories of the *Turkumanian Tartars* begin from the north, at the point of the *main*, opposite to the *Island* of *Kulala*; and also that the river of Kulala is *situated in Turkumania* [2], it may be taken for a river that falls into the sea, at, or close to Cape Karagan, which is the point of the main opposite to the Island of Kulala. Besides, as he was describing the width of a sea, he would naturally intend the Cape opposite to Agrekan.

The west point of Agrekan is situated according

[1] Woodroffe and Elton from Terki . . 150 G. miles
Bruce from Agrekan P. . . . . 146¾ ditto
New Russian map of 1800 . . . . 126 ditto
Old ditto . . . . . 133 ditto
Rogerson's map . . . . . 126 ditto
Smirnove's ditto . . . . . 120 ditto

[2] Colonel Bruce laid in a stock of water, at, or near, Karagan: perhaps at the river which he calls Kulala.

to the new map of Russia, in lat. 43° 45′ 30″; long. 47° 15; and the *site* of Terki (now in ruins) in 43° 54′ 30″; long. 46° 58′ 30″; or about 34 G. miles, N. a little west, from the mouth of the Sulak. The Cape of Karagan, on the opposite shore, is in lat. 44° 25′ by the Russian map[1]. The 150 miles of Elton laid off to this parallel, give for its longitude, 50° 24′.

But the interval between this assumed position of Karagan, and the west point of the gulf of Agrekan, is 140½ only, instead of 146¾ of Colonel Bruce: for the land projects, or swells out to the eastward, from Terki, to form what Bruce intended by the west point of Agrekan. If he really reckoned from this land, his account falls short of Woodroffe's by 5¼ miles; if from the town of Terek, 3¼ only. We are inclined to adopt the 150 of Woodroffe's, as he had probably the best means of ascertaining the distance across; and was more in the habit of measuring distances by sea.

But as the low (alluvial) islands that lie off the last point of Agrekan, extend much farther eastward than the lands about Terki, the breadth of the expanse of water between them and Karagan, is reduced to 127 on the construction. It is not improbable, that the breadth of the *whole sea*, in the part between Agrekan and Karagan, has been cal-

[1] Elton and Woodroffe . . . 44° 22′
New Russian map . . . . 44° 25′
Old ditto . . . . . 44° 21′
Smirnove's . . . . . 44° 26′
Czar Peter's . . . . . 45° 10′

culated from the positions of the *approximating lands* above mentioned. But in the new Russian map, the distance between the *Islands* and *Karagan* is no more than 100.

It will now appear, that between Cape Karagan and Astrabad; the one in 50° 24′, the other in 54° 2′ 30″, longitude; there must be a difference of longitude of 3° 38′ 3″. Elton's (or Woodroffe's) chart, is on a *plain* projection; and, therefore, no doubt, faulty; where there is a difference of $7\frac{1}{2}$ degrees of parallel. However, it has, on a course of S. 17° E. 128 miles of departure, which give 2° 49′, only, difference of longitude, instead of 3° 38′ 30″; that is, a difference of $49\frac{1}{2}$ minutes; making a difference in the angle of bearing, of about $4\frac{1}{2}$ degrees more easterly.

It is proper to remark, that much the same difference in the bearing occurs in the other parts of Woodroffe's chart: for instance, between Chetyre Bougra and Alhamrud. He has S. 15 E., and our construction S. $20\frac{1}{2}$ E. Between Kislar or Kolpichoya Bay and Alhamrud, S. 25 E. and west $30\frac{1}{4}$. But Rogerson's chart agrees nearly with ours; or rather, goes beyond it; between Karagan and Astrabad; a proof that one Russian, at least, thought as we do. Smirnove's has S. 13 and 24 E. for Woodroffe's 15 and 25, which is still farther removed from ours.

In the SE. quarter, between Astrabad Bay and Krasna Woda, it appears that Elton and Woodroffe had good opportunities of knowing the bearing of the coast; and therefore we have followed them

entirely. And it is worthy of notice, that by the new arrangement, the remainder of the coast between Krasna Woda and Karagan, northward, lies exactly in the same line with that from Astrabad, which appears not improbable.

Having now arranged the general position of the eastern coast, it will be proper to mention, that Colonel Bruce reckoned 729 wersts between the Island of Kulala, or Kulali, and Astrabad *Bar.* These, at 87 to a degree, produce 503 G. miles. The middle of Kulala is reckoned in lat. 44° 40′; and bears from Cape Karagan in the direction of the general line of the coast. Astrabad Bar is in 35° 5′ 30. On Elton's chart, we measure 475 G. miles, on a straight line between the two; but the correction of bearing increases, of course, the obliquity and the distance. And on tracing Bruce's several lines of distance, according to the prominences and indentations of the coast, over the same ground, that he must himself have sailed, in order to accomplish the object of his expedition, they will be found to accord, on the whole, very well; though not absolutely so in detail. His route is given, in a general way, No. IX. Article 10., but will be more detailed in the account of the Caspian Sea. His distances from Astrakan to the mouth of the Jaek, or Ural, 255 wersts; and thence to the mouth of the Yemba, 93[1]; total, 348, equal to 237 G. miles, will be found to agree generally.

No chart of this sea, known to be his, has ever

[1] He did not go to the Yemba; but sent an assistant.

appeared, although he mentions two copies of one, that he had distributed (p. 326). And, indeed, no existing chart agrees altogether with his observations and descriptions.

The breadth of the Caspian Sea, between Absharon point, and that called Temir-Baba (the narrowest part of it); and which divides the *middle* from the *southern* bason, is variously given, from 75 G. miles, in Mr. Smirnove's, to 120 in the Russian map, made in the time of the Empress Catherine. Having no other authority than the maps, we have left it entirely to the result of the lines of distance, used in the construction; by which it comes out 103 G. miles. The mean of the six different reports, is $95\frac{1}{2}$: but Elton and the new map allow about 97 [1].

The point of Absharon is placed partly from Elton, partly from the new map.

It appears very extraordinary, that in the new map of Russia, &c. no advantage should have been derived, either from Bruce, or Woodroffe and Elton. The lake of Balkan, notwithstanding Captain Woodroffe's description of it, remains much as it did in the Czar's first chart; that is, in *two distinct* gulfs; and both very unlike the truth. Moreover, that the coast of Korkan lies nearly in the direction of the meridian, although Woodroffe has so clearly de-

[1] Elton 97
New Russian map . 97
Old ditto 120
Czar's ditto . . . 83
Smirnove 75
Rogerson 101

scribed it, both in the map and text, to run nearly three points to the westward of it. And, finally, that in despite of the French observation at Kaswin, they persist in placing the SW. part of the Caspian more than 60 G. miles too far to the west.

Should any hydrographical enquiries be set on foot in this sea, the mountain of Demawend, and that vulgarly called *Ararat*, in Daghistan (the Mountain of Shak), will prove of great advantage in taking positions, the former being visible every where near the southern shore; the other along that of Derbend, &c. There are also other mountains highly useful as surveying marks; and it is to be regretted, that when a matter could be set to rights with a moderate degree of trouble and expense, that a great national work, like the new map of Russia, should be left in so imperfect a state in any of its parts.

SECTION XI.

Connection of Kaswin and Tehran, with Hamadan, Bagdad, and Mosul.

This combination of lines is by far the most difficult of execution of any in the whole construction; as being formed of materials of various qualities and descriptions; of lines that continually vary their directions; and without having the proper checks in cross lines of distance. And finally, the want of lati-

tudes, taken by Europeans, in some critical points of the routes.

Of these lines, the one from Kaswin and Tehran to Bagdad is the principal; and that branching from it, at Hamadan, or in its neighbourhood, to Mosul, is a secondary one. The principal line divides itself into three portions: the first, between Kaswin, Tehran, and Hamadan; and the second and third between Hamadan and Bagdad meet at Kusra Shirin; where they form nearly a *right angle;* without the advantage of *such* an observation of latitude, as might be depended on, to check the position. However, the latitude of Kusra Shirin in the Tables, appears so far satisfactory, as to agree with the construction. But there is one great advantage *throughout* this line: that is, the computation of the distance by the same person, Colonel Malcolm. There are also several latitudes taken by gentlemen of his party (but that of Kusra Shirin is wanting), and also bearings generally.

Such is the present state of Persia, that in order to go from Bagdad to Ispahan, which lies to the south of east, a traveller is compelled to go first to the NNE. nearly 90 miles, then east 100; and finally south-eastward, 260, in order to accomplish a journey of about 380. But in the time of the Sophy dynasty, Herbert went almost direct, through Kurrimabad, 130 farsangs; and did not regard it as an uncommon, or a dangerous route.

The first portion of the line to Hamadan presents no difficulties. The distances are regular, latitudes are given; and cross lines arise to check the line of

direction. On the line from Kaswin to Sava, (see p. 154), two positions arise, through which two different roads, from Tehran to Hamadan, pass: they are, Segsabad and Koushkar, or Koskera. The latter is the road followed by Mr. Vaughan, and is very *straight*; the other, taken by Colonel Malcolm, on his return from Tehran, makes a considerable angle to the northward.

Segsabad and Koushkar are both well ascertained, in position, by the routes of Bell, Chardin, and Kempfer, on the common road from Zengan and Kaswin to Sava. The former falls in lat. 35° 43′ 15″, and at one mile to the E. of the meridian of Kaswin. Koushkar is 26½ G. miles to the southward of Segsabad.

There is, moreover, a third line, that of M. Olivier from Hamadan to Tehran, through Segsabad; but following a distinct path from Mr. Vaughan and Colonel Malcolm; save in the single point of Segsabad. These variations are probably owing to the want of security on particular roads, at particular times.

Between Hamadan and Segsabad, Colonel Malcolm reckoned 37 farsangs; and from Tehran to Segsabad, 24. The interval on the construction, between the two latter, is 65 G. miles; giving a rate of 2·7 for each farsang *direct*. This portion of the road is pretty straight in the sketch (which arrived in time for this Part); but the case is far otherwise between Segsabad and Hamadan. That the reader may be convinced of this fact, we shall lay before

him the general courses of the different portions of the road.

First, from Segsabad to Abgurm the bearing is about SW. 13 farsangs. Thence, SW. by W. $10\frac{1}{2}$, to Tuckia: thence west, 5, to Kabutrahang; and finally $8\frac{1}{2}$ SSW. to Hamadan.

The mode pursued, in laying off the distance of 37 farsangs, taken at 2·7 each, and forming an aggregate of 100 G. miles within $\frac{1}{10}$, was this. The distance was traced through the different points of the route, according to the traverse, between the parallel of Segsabad, and that of Hamadan, which is 34° 47′ 30″ by Colonel Malcolm's observation; and the longitude found for Hamadan was 47° 56′ 30″. It happened that the latitude of Kabutrahang was also taken, 35° 12′, which fixes that angle of the road[1].

In this position Hamadan stands at $96\frac{1}{2}$ G. miles from Sava, nearly west. Edrisi and Abulfeda allow 90 Arabic miles; or $95\frac{1}{4}$ Geographic.

Mr. Vaughan reckoned $72\frac{1}{2}$ hours of the caravan, between Hamadan and Tehran, a line of 157 G. miles; giving a rate of 2·166, which appears very probable. But of these $72\frac{1}{2}$, the $43\frac{1}{3}$ to Koushkar, (see page 191), fall about three miles to the westward of that place; which, however, cannot be regarded as a great difference in so long a line. It has the effect of making the rate (admitting the position of Koushkar, to be minutely exact, 2·092 on the Tehran side; 2·22 on the Hamadan side.

[1] The Oriental Tables give 2° west of Kaswin, or 47° 33′; lat. 35° 10′; which is an error in parallel of $22\frac{1}{2}$ minutes.

Olivier reckoned 75 *hours and leagues indiscriminately*; (and, we conclude, reckons them the same as many others have done). Of these, 42½ are between Hamadan and Segsabad; 32½ thence to Tehran. The whole line is 164½ G. miles, whence a rate arises of 2·187; very little different from Mr. Vaughan's. But with respect to the distribution, he places Segsabad 6 miles to the westward of its position on the map. It may be recollected, that Mr. Vaughan's comparative distance placed Koushkar 3 to the west; hence, it may be suspected, that the line from Kaswin to Sava may form a deeper curve to the westward than the map represents; although these differences cannot be supposed to be the real ones in respect of quantity.

The position of Hamadan is very much corroborated by the lines of Messrs. Vaughan and Olivier; and that of the Oriental Geographer from Sava has the same effect.

Hajy Kalifa has 57 hours between Kaswin and Hamadan. Of these, 32 are to Derguezin, (which we take for the Auvah of Malcolm); 25 thence to Hamadan. The *direct* distance is 116½; through Derguezin, 121; and consequently the rate, 2·12; caravan rate must therefore be supposed. Abdulkurreem calls it 7 journeys, which must therefore be of 17¼ G. miles; and which is really, very nearly, the standard of an ordinary journey. He travelled it himself in 1741. On the whole, the position of Hamadan appears to be satisfactory.

Before the other three portions of the line to

Bagdad are entered on, it will be proper to adjust the line from Hamadan to Mosul, through Dainawar and Shahrazour. This line is not brought forward with a view towards verifying the position of Hamadan; but rather to shew the distribution of the space between it and Mosul. The only particular in it, belonging to the *data* for the general construction, is the bearing of Shahrazour on Kusra Shirin: the use of which is to *lessen the uncertainty* of the *data*, for the position of the latter place.

Tavernier relates the particulars of his journey from Mosul to Shahrazour, so very obscurely, that it is not without difficulty that it can be understood that 7 days were employed on the road, with a caravan; although between Shahrazour and Hamadan 9 more can be pretty clearly made out. For the 7 days, $107\frac{1}{2}$ are allowed. Abulfeda and Edrisi allow 5 days between Samarra on the Tigris, (22 farsangs, taken at 66 G. miles above Bagdad,) and this line of 95 meeting the $107\frac{1}{2}$ from Mosul, places Shahrazour in lat. 35° 42′, long. 45° 4′ 30″ [1].

The Turkish geographer quoted by Otter allows 8 journeys from Bagdad to Shahrazour; or 152 G. miles: on the construction there are 146, direct; but through Kusra Shirin, the probable line of the road, $151\frac{1}{2}$.

The latitude of Shahrazour is given from 35° 30′

[1] The positions along the course of the Tigris between Bagdad and Mosul belong to the detail of the geography of Mesopotamia. But the construction will be easily understood by a reference to No. IX. There, Samarra will be found 66 G. miles N. 18° 30′ W.

to 35′ and 45′; but in five instances 30′. The longitude, 80° 20′ to 82° 30′; but the degree was meant to be 80, in all, doubtless. Therefore the longitude of Shahrazour by the Tables, will be from 4° 30′ to 4° 40′ west of Kaswin; or 44° 53′ to 45° 3′ east of Greenwich. And the construction above gives 45° 4′ 30″.

From Shahrazour to Hamadan, Tavernier was 9 days, with caravan, or 138 G. miles, at the former rate. The interval on the construction is somewhat more; being about 146½, and is justified by the reports of the Oriental geographers. And indeed the 16 caravan days of Tavernier agree perfectly: for as the whole distance, on the construction, between Mosul and Shahrazour is 254 G. miles, the rate of the caravan will be nearly 15·9 *per* day.

Here is the detail of the distance. Edrisi and Abulfeda allow 4 journeys, or 76¼ G. miles between Shahrazour and Dainawar. This place is given at 35° latitude by the Tables: but it being said to be only 40 farsangs from Maraga, (or Meraugheh), equal to 127 G. miles; and to bear to the north of west from Hamadan, it may be supposed to be 12 or 14 min. to the north of 35°.

Between Dainawar and Assadabad (the Saudabad of Malcolm), Abulfeda allows 17 farsangs, or 54 G. miles. This place is 7½ farsangs of Malcolm's, west, southerly, from Hamadan; for its latitude was found to be 34° 46′. As this road crosses the whole base of Mount Elwend *(Orontes)* 18½ G. miles, *direct*, may be sufficient. The caravans make 9½ hours.

If the two lines be reduced to one, (that is, the

18½ W. southerly, and the 54 WNW. northerly,) the distance between Dainawar and Hamadan will be 68½; which, added to the 76¼ from Shahrazour, give a total of 144¾, or 145: whilst 146½ is the result, on the construction.

Here then, the accounts of the distance between Mosul and Hamadan agree too well almost for belief; for Mosul, as we have seen, (page 8,) is determined by M. Niebuhr's bearing, from Bagdad, westward: and Hamadan is deduced from Kaswin, a point fixed by celestial observation. So that the two extremities of this line, which are fixed by authorities totally independent of each other, fall within 2 miles of the detailed reports of the distances between them. And since the caravan rate was taken too low, between Mosul and Shahrazour, that distance ought to be corrected from 107½ to 111¼: but considering the nature of the materials, it would be losing too much time to arrange the whole context of that quarter anew. The same reasoning that applies to the interval between Mosul and Hamadan, may justly be extended to Kaswin, since the remainder of the space is at least equally well determined: and in fact, Mosul appears to be satisfactorily placed in respect of the two places of observation, Aleppo and Kaswin; between which it occupies the middle space.

Having established the position of Shahrazour, we proceed to Kusra Shirin; the point at which the second and third portions of the line from Kaswin to Bagdad meet.

Kusra Shirin is situated to the NNE.[1] of Bagdad; and at no very great distance from Eski Kupri, on the northern road to Arbel. No satisfactory cross line, however, has been found, either from that road, or from any place on the banks of the Tigris, in order to check the direction of the line to Kusra Shirin. There is, indeed, one in the early part of it, between Chiba Kupri and Haroony; but that is nearer to Bagdad than to Kusra Shirin.

It would appear, therefore, that the best mode of placing Kusra Shirin, is by considering the routes to it, from Bagdad and Hamadan as *two single lines*, whose point of convergence is Kusra Shirin. In other words, the two sides of a triangle, of which the distance between Bagdad and Hamadan, is the base. In order to this, the line from Hamadan, which, in fact, is broken into two distinct parts, must be reduced into one. It fortunately happens, that Kermanshah, the point which unites the two parts, has its latitude given, by observation; by which the result is rendered more certain. And there are several different reports of the distances, and also some bearings; all which afford the means of detecting errors.

First, of the line from Bagdad to Kusra Shirin.

There are six reports of the distance: 1. M. Otter reckoned 35½ hours on horseback, and with a party. 2. Mr. Vaughan, 43½ hours, with a caravan; but

[1] The passage of Tak, over *Mount Zagros*, lies in that direction. It is the easiest of ascent in the whole range; and, of course, proportionably circuitous.

losing their way, perhaps only 42 can be allowed. 3. M. Olivier, with a caravan, 43 hours (on his return): outward, his time is imperfect. 4. Colonel Malcolm's report is 35 farsangs; reckoned equal to 122½ British miles, by the road. 5. A second: and 6. A third report, by gentlemen of his suite; respectively 96, and 116, British miles [1].

Of routes, given in *time*, those of caravans are unquestionably the best; as being not only the most uniform in point of rate, throughout any given route, itself; but that caravans, which are alike circumstanced, vary the least possible from one another, in their rate of movement.

Mr. Vaughan's rate during that part of the same journey, between Hamadan and Tehran appears to have been 2·166 on 72½ hours (p. 192); although there can be no certainty, because Hamadan is not determined precisely. The 42 hours here would give 91 G. miles over ordinary ground: but the last 15 are over very rough ground; and therefore 89 may be taken. Olivier's would give something more; being 43 hours at a rate of 2·187; and 92 will be the result. Otter's 35½ hours, on ordinary ground, might have been at 2⅔ rate, here 2½ may suffice; and 89 will be the result. Colonel Malcolm's *own* account 35 farsangs, at 2·7, as before, would be 94½: but here, 92 may be sufficient. The other two accounts go below his, in the estimation of

[1] Hajy Kalifa has two routes to Kusra Shirin; the one direct, by Shahraban, 32 farsangs; the other, by Chibak Kupri, 48 hours.

the road distance; and taking the highest of these, it goes below 90; and the lowest to 76. We have taken 89; which is only 1 mile below the mean of the *first five* reports: disregarding the sixth.

Edrisi reckons 6 days from Bagdad to Holwan, 15 A. miles *beyond* Kusra Shirin. The result would be 98 G. miles, which is altogether improbable.

He also allows 60 A. miles between Kusra Shirin and Shahrazour (63½ Geogr.) which appears to be just: also 54 A. miles between Shahrazour and Holwan. The latitude of Kusra Shirin, by the Oriental Tables, is 34° 40′ in two instances; in a third, 34° 55′. In Malcolm's sketch, 34° 36′. It is remarked in the same sketch, that the bearings, &c. between Kusra Shirin and Bagdad, are vague, &c.: so that we are deprived even of this last, and *expected* resource.

Having completed the third portion of the line, we proceed to the examination of the second portion, between Hamadan and Kusra Shirin.

Saudabad, or Assaudabad, the first town from Hamadan, has been already placed (in page 195) at 18½ G. miles, about W. by S. from Hamadan; in the line towards Mosul.

Unfortunately, the sketch of Colonel Malcolm's route loses a great part of its value, by the *distortion* of its longitude; which vitiates those bearings that might otherwise have been of the greatest use: for between Bagdad and Tehran, there is an excess of a degree and a half of longitude in six and a half. However, in the quarter now under consideration, (as well as generally between Tehran and

Kusra Shirin) the course being so near the parallel, a great part of the evil complained of is necessarily done away; so that the bearings will be available, in the place, where, indeed, they are the most wanted.

The road from Saudabad to Kermanshah is broken into four parts: Iokengawar, SW. or SSW. 6 farsangs; Sahnee, WSW. $3\frac{1}{2}$; Beysitoon, south-westward 4; Kermanshah, W. by S. 5. Total, by Malcolm, $18\frac{1}{2}$ from Saudabad; or $64\frac{3}{4}$ road miles. The other Journals of the same party have, respectively, 74, and 73. Vaughan has $24\frac{1}{2}$ hours (caravan); Thevenot, 28; Olivier, 27.

These accounts differ more than would have been expected: and it may be suspected that Mr. Vaughan's is erroneous. The mean of Malcolm's three reports, taken at 70 road miles, might produce 53 or 54 Geogr., over an ordinary road; but this is a traverse, from SSW. to W. by S.: and the direct line may be no more than 49. The mean of the three caravan routes, $26\frac{1}{2}$ hours at Mr. Vaughan's rate, give $56\frac{1}{4}$ for the *traverse;* which, reduced to a straight line, as in the former case, produces $51\frac{3}{4}$.

We have allowed $51\frac{1}{2}$ G. miles between Saudabad and Kermanshah; the latitude of which is 34° 18′ 40″, by Malcolm's party; 34° 14′ by M. de Beauchamp (as quoted by M. Olivier). We have adopted the former: and Kermanshah will fall in long. 46° 39′ 30″, and bears W. 32 S. from Saudabad. Thus, that part of the line, between Hamadan and Kermanshah, is completed.

The next part, between Kermanshah and Kusra Shirin, is still more perplexing than the last; from

the inflexions occasioned by the ascent and descent of Mount *Zagros;* and the circuit that the road takes, in coming to it, from the quarter of Kusra Shirin. Accordingly, each part must be considered separately.

There is a remark in the sketch of Colonel Malcolm's route, that between Bagdad and the summit of *Zagros,* " the sketch and distances are very imperfect:" which guards us against relying too much on its authority, in opposition to other reports.

Between Kermanshah and Kerrend *(Carina),* near the top of the pass (of *Tak),* the road is generally straight, and the country open; (it being a part of the celebrated *Nisæan fields* of antiquity). The distance is 16 farsangs by Malcolm, or 56 road miles; the other two journals have each 55; which is an unusual coincidence. Thevenot has $22\frac{1}{4}$ hours; Vaughan, $21\frac{1}{2}$; Olivier, 19; Otter, 18. The 56 may be taken at $43\frac{1}{4}$ G. miles, *direct:* the mean of the other four, at 42, (Vaughan's alone, at $46\frac{1}{2}$); and 43 are adopted.

Colonel Malcolm's idea of the parallel of Kerrend, is 34° 39′. But no *observation* of latitude was taken to the westward of Kermanshah: 34° 38′ is the parallel assigned, on the construction.

On this line arises Harounabad, a position necessary to be noted, because a line from Bagdad and Modain falls in there, in the sequel. The lat. of Harounabad is taken at 34° 33′ 30″; and $15\frac{1}{2}$ G. miles to the ESE. of Kerrend.

The *road distance* between Kerrend and Kusra Shirin, is by the three accounts of Malcolm's party

14 farsangs, or 49, 50, and 52 miles by the road: mean, $50\frac{1}{3}$; and which, on ordinary ground, might produce 38 or 39 G. miles direct. The reports of Vaughan and Olivier are 27 caravan hours; which might be expected to be equal to 67 or 68 road miles; and differs so much from the former, as to require investigation; since the difference is a full third part. That *some* more hours might be consumed by a caravan in ascending and descending a mountain, which took up Otter 3 hours to clear, on horseback, is to be expected: but here is *one-third* of the whole difference. One can only conceive, then, that great as the detour might be, which Colonel Malcolm made, that there is yet a more circuitous road, for the loaded beasts of the caravan. There is no getting rid of the 27 hours; because we have *two distinct reports;* one of Mr. Vaughan, the other of M. Olivier.

On a reference to the sketch, one finds that $11\frac{1}{4}$ farsangs, in direct distance, are allowed, for the 14 by the road. Such were the ideas of the party themselves: and the result may be taken at $30\frac{1}{2}$ to $31\frac{1}{2}$ G. miles; which is no more than $1\frac{1}{6}$ mile direct, *per* hour, for the caravan. Perhaps, *here* we ought to recollect the caution, in the sketch; as the vague part of the sketch is said to commence at the pass. We have therefore allowed 35 G. miles between Kerrend and Kusra Shirin; which is yet less than $1\frac{1}{3}$ *per* hour. But a glance at the map, No. IX. will shew how exceedingly circuitous that part of the route is.

If, therefore, 35 G. miles be laid off from Kerrend,

in lat. 34° 38′, to the *approximated* parallel of Kusra Shirin, which is nearly the same as Kerrend; it will be found that this line, together with the 43 from Kermanshah to Kerrend, on a bearing of W. 27° N., will form one line of 76 G. miles, between Kusra Shirin and Kermanshah; and is a part of the second portion of the line, between Tehran and Bagdad. Also, that if to this be added the former part of the same portion, between Saudabad and Kermanshah, 51½ G. miles, W. 32° S. (see page 200); the whole will form a line of 117½ between Saudabad and Kusra Shirin, (or 136 from Hamadan): and this is one leg, or side, of the triangle, proposed in page 197; of which the other is the distance between Bagdad and Kusra Shirin; and the *base*, that between Bagdad and Hamadan (or Saudabad; for it is equally the same).

Therefore, if this line of 117½ from Saudabad, or of 136 from Hamadan, be laid off, to meet that of 89 from Bagdad, they will meet, in lat. 34° 39′, long. 45° 10′ 45″; which will be the place of Kusra Shirin, according to the above calculation.

In this position Kusra Shirin stands at 64 G. miles from Samarra on the Tigris, (which is 66 G. miles above Bagdad), in an ENE. direction. M. D'Anville in his latest map allowed 80; but M. Delisle, 60 or 61 only. This diversity of opinion would lead one to conclude, that they had not met with any route, from one to the other. But the author is certain that he has read, in a French book of Travels, the detail of such a route, although he cannot recollect where.

This is the most intricate and uncertain of all the lines that we have examined. And the constant impression on the mind is, that the Itinerary measure, reported, is greater than the space found on the construction; between Hamadan and Kusra Shirin. And, in effect, this is the case: for the road distance being 202 British miles, by the mean of three reports of Colonel Malcolm's party; and by Olivier, 80½ hours, which at caravan rate, is 201; whilst the space on the construction is no more than 157½ such miles; it is evident that nearly ¼ of the distance is consumed in the windings and inequalities of the roads. But then, it must be recollected, that the scene lies in the Kourdistan mountains.

There is a slight check to the positions in that part of the line between Kermanshah and Kerrend, by a route from Bagdad, through the Pass of Ghilaneh (or Alla Akbar), to Harounabad, before mentioned.

This Ghilaneh appears to be the *Celonæ* of ancient history, at the foot of Mount *Zagros;* the pass by which Alexander went to *Ecbatana* (Hamadan), through the *Nisæan* Plains.

Abdulkurreem, who travelled from Kaswin to Bagdad by way of Hamadan, Kermanshah, and the Pass of Ghilaneh, reckons this latter 4 journeys from Bagdad. He made 10 journeys from Hamadan to Bagdad: the first 3 to Kermanshah; 3 thence to Ghilaneh; and 4 more to Bagdad. Hence the first 3 must have been of 23 G. miles *direct,* each day; the next 3, if through Harounabad, 20 *per* day;

and the 4 from thence to Bagdad, 21. So that his mean rate was $21\frac{1}{4}$ to $21\frac{1}{2}$ [1].

This general position of Ghilaneh, at 84 to 85 G. miles to the NE. of Bagdad, appears to be very consistent. It answers, in the first place, to the *Chala* of Isidore of Charax; at 30 schoenes, equal to 120 MP., or about $85\frac{1}{2}$ G. miles direct, from *Seleucia*, at the Tigris, (now Modain), in the road to *Carina* (Kerrend) and *Ecbàtana*. Midway was situated *Chalasar*, or *Artemita*, taken for the present Beladroud, which also agrees.

Celonæ was also at 7 marches of Alexander from *Opis* on the Tigris. Now, although there is no certainty respecting the position of *Opis*, yet the course of the Tigris being so nearly at right angles with the line of march to Ghilaneh, the result will be much the same, if it be any where within 20 miles on either side of the assumed position of it, on the map [2]. If, therefore, the 7 marches of Alexander be laid off from the supposed site of *Opis*, to meet the $85\frac{1}{2}$ from Modain, the intersection will take place *near* the situation in which Ghilaneh ought to stand in modern geography. However, 7 mean marches give $74\frac{1}{4}$ G. miles, only, direct; but Ghilaneh appears to be 4 or more miles farther to the east: and it is a matter not worth contending for,

[1] That is, about $27\frac{3}{4}$ British miles, by the road. He was on horseback, and in a small party. (See Abdulkur. pages 94 and 97.)

[2] *Opis* is supposed by the author to have stood nearly in the situation of the modern town of Akbara; 22 or 23 G. miles above Bagdad, on the east bank of the Tigris.

whether the marches were $\frac{1}{2}$ or $\frac{3}{4}$ of a mile longer, or that there are 4 or 5 miles too much in the breadth of the space between the Tigris and Ghilaneh. The position appears to answer to *Celonæ*, and to *Chala*.

But it is not intended to rest the position merely on the notices in ancient geography: but these have been brought forward, in the first instance, because the authorities were formed of *whole* lines of distance, which more readily marked the point sought for. We shall now produce the modern authorities; which are composed of many broken lines; but which, it is hoped, will prove more satisfactory than the former.

The ordinary route of the caravans from Bagdad to Ispahan, is by Mendeli, and Harounabad; avoiding Ghilaneh and the pass of Alla Akbar [1], as being too difficult; and ascending Mount *Zagros* by that of Derteng, (as the nearest) situated between Alla Akbar and Tak. This is the route taken by M. Thevenot; whilst M. Otter ascended by Tak; and descended by Alla Akbar, or the Pass of Ghilaneh, (or *Celonæ*).

Mendeli lies equally in the road to Alla Akbar and Tak; the roads separating at Jemsoury, or Sam-

[1] M. Otter, who descended this pass in 1739, says that it was opened by Shah Abbas, when he went to besiege Bagdad; but was at that time in so bad a state that he could not conceive it passable by an army.

Doubtless Shah Abbas may have restored, or improved it; but it was surely the pass by which Alexander ascended: and also the *ascent of Zagros*, mentioned by Polybius in lib. v. c. 5.

soury, 10 hours beyond Mendeli; 5 short of Ghilaneh. M. Otter, who was on horseback, and in a small party, made a direct course between Ghilaneh and Harounabad. M. Thevenot, with the caravan, went by the circuitous route of Kerrend.

Mendeli is thus placed: Della Valle gives it at 3 journeys from Bagdad, to the NE. Thevenot's caravan, in order to reach it, first ascended the bank of the Tigris, to Lokman, 13 G. miles; then ENE. to Bakuba, a pass on the river Dealla, 9 hours; from whence it was 9 more to Imaum Esker, (the same as Beladroud and *Artemita* [1],) which is itself 9 short of Mendeli. Thus Mendeli is 27 caravan hours to the eastward, or rather E. by N. northerly, from Lokman; or 18 from Bakuba, a fixed point on the Dealla.

Beladroud has already been mentioned as the *Chalasar* of Isidore, 15 schoenes, or 43 G. miles from *Seleucia*. This line, with that of the 18 hours from Bakuba, or 27 from Lokman, places Beladroud. Thence to Mendeli Thevenot reckoned the bearing eastward; probably to the northward of east, as before. Mendeli, then, at three journeys from Bagdad, and 18 hours from Bakuba, will take a position nearly midway between Bagdad and Harounabad. For M. Otter reckoned 15 hours between it and Ghilaneh; 14 thence to Harounabad; for which 29 hours, something more than 60 G. miles, may be allowed; but the angle at Ghilaneh, and the badness of the road between it and Mendeli, more

[1] More will be said concerning *Artemita* presently.

than balances the effect of the smoother road, through the *Nisæan* fields, above the pass of Ghilaneh.

The 14 hours between Harounabad and Ghilaneh, allowing 32 G. miles for them, agree very well to the position of the latter, taken as the *Chala* of Isidore, 30 schoenes, or 85½ G. miles from Seleucia; for the interval on the construction, between Bagdad and Harounabad, is 118 G. miles; and the sum of these two, 117½, which the small angle at Ghilaneh would reduce only a fraction lower.

Thus, the general agreement is clear, and we return to Mendeli, whose position requires some further examination.

If Della Valle's 3 days are to be taken at the scale of ordinary journeys; that is, at about 53 G. miles direct from Bagdad, and 57 or 58 for the 27 hours from Lokman; and these lines are to fix the position of Mendeli, it would fall to the SE. of Beladroud, which is not only improbable, but contrary to report, which says that it lies *eastward*, and more probably to the ENE. But there is also another consideration; which is, the distance of Mendeli, from Ghilaneh and Harounabad. For, from the former, it is 15 hours of M. Otter's; for which no less than 32 G. miles can be allowed, although the road lies through the hills that form a part of the base of Mount Zagros; and from Harounabad 29 hours, or more than 60; but the space between the just mentioned intersection and Harounabad, is not less than 70, and between it and Ghilaneh, 43.

Mendeli, therefore, is placed at 59 [1] from Bagdad, which is allowing about 2 miles more on each day [2], and at 58 from Lokman; in which position it is 32 short of Ghilaneh, agreeing with M. Otter; and it then bears a point and a quarter to the N. of E. from Lokman; not very different from Thevenot's *east*. This being disposed of, we next allow 32 G. miles for the 14 hours of Otter, through the fine country above the pass, to Harounabad, and then a line of 61, *direct*, will be completed, as the space between Mendeli and Harounabad; 118, as before remarked, being the space between the latter and Bagdad, on the construction.

M. Thevenot's route from Mendeli to Harounabad, although it adds very considerably to the detail of the geography, brings scanty materials for the general construction.

He remarked, that from Jemsoury, the road turned more to the north. This place is 5 hours short of Ghilaneh, which remained on his right; he skirting the foot of the ridge, northwards, to the pass, or ascent of *Zagros* at *Derteng*, and thence to Kerrend, where he fell into the road from Tak.

Thevenot was 30 hours from Mendeli to Kerrend, a space of 57 G. miles on the construction; 22 of these were to Derteng, the other 8 to Kerrend. The relative position of this place to Harounabad has already been explained (p. 201.)

[1] The suburbs of Bagdad might at that time have extended a vast way to the eastward, and the reckoning might have commenced from the skirts of the city.

[2] Della Valle was, in effect, flying from danger.

Hajy Kalifa has a route from Bagdad to Kusra Shirin and Kerrend, by the pass of Derteng, which furnishes a line of 13 hours from Kusra Shirin to Derteng, and thereby checks its position, in respect of the former. It also, in a small degree, checks the position of Ghilaneh, in respect of Kusra Shirin.

This route, moreover, furnishes the means of connecting the great northern road, from Bagdad to Mosul, with that to Kusra Shirin. For it first goes on the *north* road to Chiba, or Chibak, and then turns off to the NE., to Haroonye, 4 or 5 miles to the NE. of Shahraban [1]. It appears by this, that the two roads are about 10 G. miles asunder, in the neighbourhood of Shahraban and Chibak, which lie nearly opposite to each other.

Thus we have closed this very intricate, tedious, and necessarily prolix enquiry; but it was judged necessary to put the above notices on record, as no small portion of labour and time would be required to collect and arrange them anew.

It may be proper to add, that Alexander, in his way from *Opis* to *Celonæ*, passed by *Charræ*, on his fourth march. This place is found in the Theod. Tables, at 24 MP. from *Artemita*, which appears to be the same with Beladroud, as the 24 MP., equal to $17\frac{1}{4}$ G. miles, fall exactly in the line, between *Opis* and *Celonæ*. *Charræ* [2] is also 20 MP. from *Peloriaca*, which answers to Jalula, on the Dealla, above Shahraban, which was doubtless *Apollonia*,

[1] Taken for *Apollonia*.

[2] Possibly the Kara-Oulous of Hajy Kalifa.

although it does not appear in the Tables; and, finally, *Peloriaca* is 20 from *Gibrata* (Chibak [1]?).

Another circumstance may be mentioned here, although it does not immediately affect the construction. Alexander made 7 marches from the *Nisæan* plains to *Ecbatana;* and if we lay off 74¼, the length of 7 mean marches, that distance will reach from Hamadan to Mahi-deslit, which is situated in the eastern quarter of the tract, taken for the *Nisæus Campus.*

SECTION XII.

Connection of Hamadan, Kengavir, and Sahnee, with Ispahan.

THE following are the several roads connected with this line:—

1. The great road of the caravan from Hamadan to Ispahan, by Dizabad, Meshed-Feraban, and Gulpaigan.

2. The road from Sahnee to Ispahan, by Nehavend, Oroudgherd, and Kounsar; being a continuation of the Bagdad road to Ispahan, and the most southerly branch of it.

[1] Chibak was reckoned 20 hours from Bagdad; there the road turns off to the right, through Hashekye to Haroonye, on the Kusra Shirin road, 7 hours, and thence to that place, 21. Haroonye occurs in Della Valle.

3. Another branch of the same road, through Kengavir, leading between the two former, and occasionally running into the Hamadan road. And,

4. A branch of the same road from Kengavir, leading through Dizabad.

Hamadan to Ispahan.

Ispahan is said by Abulfeda to be 80 farsangs from Hamadan. These amount strictly to 254 G. miles direct. The actual distance on the construction is 240 miles; giving exactly 3 G. miles *direct* for each farsang [1].

M. Thevenot reckoned about 100 hours with a caravan; whence his rate was 2·4 G. miles per hour. In what manner this caravan was formed, we know not: had there been camels, the rate could not have been much beyond $2\frac{1}{10}$; for even the caravans of Asia Minor, not composed of camels, go no faster than 2·2 to $2\frac{1}{4}$ per hour [2]. Had this been the single instance of a high rate on this road, it might have been referred at once to error in time; a fault that

[1] The farsangs are of great length in this part of Persia; and more particularly on the great roads that lead from Ispahan, as a centre, to the N., NW., and W.

[2] One may suppose that there were no camels, but horses and mules alone, and those chiefly *loaded*. M. Thevenot remarks, after saying that the Turkish agatch and the Persian farsang were the same, and *both* an hour's journey for a horseman, that it was *almost two* for them. This implies a slow rate; but the phrase of *almost two* must be regarded as vague in the extreme. He adds, that near Ispahan the farsangs were so short, that they travelled one an hour. All this is surely vague; save that a farsang is really an hour's walk for a horse, *not loaded*.

M. Thevenot was not ordinarily guilty of; and here the difference is equal to about 7 hours travelling. But the reports of M. Otter and M. Olivier go to prove the same fact.

M. Otter went over the same ground, on horseback, and with a small party, between Ispahan and Dizabad, in 61 hours, which M. Thevenot went in 76, with a caravan; that is, as nearly as possible, 3 G. miles per hour, *direct;* a rate never heard of before. The proportions too are curious: Otter's is just $\frac{1}{4}$ more than Thevenot's, which is just the proportion between the rate of a caravan and that of a horse, in these countries. Reduce Thevenot to 2·15, and add $\frac{1}{4}$, there are 2·6, the ordinary walk of the horse, (in *direct* distance,) or 2·2 with $\frac{1}{4}$, 2·64.

On the road from Sahnee to Ispahan, M. Otter went on horseback, in the train of two ambassadors (Persian and Turkish), in 106 hours; distance direct, 262 G. miles. *Here*, the rate would probably be under the usual horse pace, from the nature of their proceedings; and it was 2·47.

M. Olivier went from Ispahan to Gouga (Gulpaigan) in $35\frac{1}{2}$ hours, which Thevenot reckoned 34. The distance on the construction, 87 G. miles; the rates, consequently, 2·45 and 2·56. The remainder of M. Olivier's is too imperfect to draw any inferences from.

It must be confessed, that the report of M. Thevenot, together with M. Otter's on his *return;* as likewise M. Olivier's, during the only 34 or 35 hours that admit of a comparison; contribute to raise a

suspicion, that the distance between Hamadan and Ispahan is not so great as on the construction, although given on authorities that we must hold indisputable. But caravan rate, if the time be properly noted, (and Thevenot was a regular man,) is too definite to be easily set aside. It cannot either be supposed that so many persons erred in noting the time. Moreover, the caravan rate of Thevenot was so different, in the former part of the same journey. But we have no right to dispute the authorities on which Ispahan and Hamadan rest; but it is our duty to record our suspicions[1].

There are some geographical points, arising on these roads, that ought to be determined with all the precision that the nature of the case will admit; as four of them are points of outset for important lines of distance.

Nehawend occurs on the southernmost route from Bagdad to Ispahan, at 16 hours of Otter's, beyond Sahnee. It is also given at 14 to 16 farsangs, almost due south from Hamadan, according to Ibn Haukel, Edrisi, and Abulfeda, and therefore ought to be about 3 minutes to the northward of 34°. The Tables give from 34° 10′ to 20′; but they place

[1] It is proper to remark, that the latitudes taken by Colonel Malcolm's party differ very considerably from the observations of others, in certain parts. That of Ispahan is 14 minutes to the N. of M. de Beauchamp's. Kermanshaw differs 4′ 40″, in the same way. And there is no possibility of reconciling that of Shoolgustan, within 10 minutes; being, like the others, too far to the north of the parallel.

Hamadan 12 or 13 too far north, according to Colonel Malcolm. This place (Nehawend) is of much geographical importance, as a line of Ibn Haukel's, and of Edrisi's, leads from it to a position in Khuzistan.

Oroudghird, or Roudghird, is 15 hours, of Otter, to the eastward of Nehawend, and is 18 farsangs, or 54 G. miles from Hamadan, according to Edrisi: 19 by Ibn Haukel. Accordingly it falls in latitude 34°; longitude 48° 39′ 30″. De la Croix allows 50 min. of longitude, equal to 42 G. miles, between it and Nehawend, which differs but little from Otter's result. This position is of considerable importance, also; as Timur set off from it for the country of Kurrimabad and Khuzistan, and from whose marches some useful notices are derived. It is proper to mention, that Edrisi names this place *Barugherd*, as another does Berzagherd; or perhaps they may be only errors of copyists. The Roudgherd and Oroudgherd are easily reconciled.

Meshed-Feraban are two separate and nearly adjoining towns, once of considerable importance. They are named, by Abulfeda, Karag-Abi-Dolaf; by Ibn Haukel, Kurreh; and by Edrisi, Karch. In the Ayin Akbary, Kurj. [The *g* of Reiske's translation is doubtless meant to be pronounced *soft*; so that the Karag, Kurreh, Karch, and Kurj, all come nearly to the same thing.] To all these names, as belonging to one and the same place, the latitude given is 34°; longitude 84° 45′; or 15 minutes west of Kaswin: that is, 49° 18′. Being 39 hours of Thevenot's from Hamadan, it falls in 49° 21′; and supposing it to lie nearly

in the line between Hamadan and Ispahan, it cannot be many minutes below 34° latitude [1].

Edrisi says that it is 30 Arabic miles from Berzagherd, which he places at 54 such miles from Hamadan. This place is evidently the same with Barugherd and Oroudgherd, which we have just placed, and 30 A. miles, or nearly 32 G. miles from that place, will agree *generally*, but not exactly; the interval on the construction being 35, and may be owing to a general excess of distance between Hamadan and Ispahan.

The intermediate distances agreeing so well, is in proof that Berzagherd and Barugherd are the same with Oroudgherd; as also that Meshed-Fereban occupies its proper position, in the view of general geography. M. D'Anville considered them as distinct places; for he places Karg midway between Feraban and Sava.

Ghulpaigan (called also Jerbadkan, in the Oriental Tables) lies on the road from Hamadan to Ispahan; distant from the latter 34 to 35½ hours of Thevenot and Olivier. It is a small city, and noted particularly here, because Ibrahim Effendi allows 45 G. miles between it and Kashan; Zach, 64. Its latitude is given, in the Tables, from 34° to 34° 15′; Zach places it, in M. de Beauchamp's map, in 34° 21′. The longitude in the Tables is 85° 25′ to 85° 35′, or 1° 11′ to 1° 21′ W. of Ispahan, answering to 50° 29′ to 39′. When placed in 34° 15′ lat., the longitude

[1] M. Otter (Vol. ii. p. 8.) speaks of these places, which he passed through, as being close together, and writes *Guerdge* and Ferahan.

agrees within a minute or two of the former account, and it will be 55 instead of 45 from Kashan.

Kounsar is another small city, on the southern road, nearly opposite to the last, and at $18\frac{1}{2}$ G. miles to the southward of it, according to Zach, and which agrees within $3\frac{1}{2}$ minutes of the latitude given for it, which is 33°. From this place, there is a line of distance, westward, to Kurrimabad, in Ibrahim's map.

Kounsar is 34 of Otter's hours to the NW. of Ispahan, or about 84 G. miles. The reputed distance is 25 farsangs, or 79 such miles. Here, again, appears an indication of an excess of distance.

Dizabad, or Dizawa, is the place where the northernmost road from Bagdad falls into that from Hamadan, towards Ispahan. It was 24 of Thevenot's hours from Hamadan, and about 21 of Otter's from Kengawar; quick travelling. It falls into the line, between Hamadan and Ispahan. It may be strongly suspected that Otter has omitted a part of his time on this line; for M. Olivier allows $7\frac{1}{2}$ hours between Perisbe and Kengawar, for which M. Otter allows only 5.

SECTION XIII.

Connection of Bagdad, Basrah, and Ispahan, with Shiraz.

This part of the subject is difficult and operose, from the want of good materials, and from the necessity

of employing so many documents, which, in their nature, cannot be exact; and all through the want of a celestial observation for the longitude of Shiraz, or a correct bearing of it from Ispahan. At present, we possess only the vague estimation of the bearing by travellers; for the one which appears in the sketch of Colonel Malcolm's route, appears to be drawn from the *supposed* differences of longitude throughout. Moreover, in the same sketch, the bearing of Chelminar *(Persepolis)* from Shiraz, taken by Niebuhr, at his leisure, differs two full points; so that, although Shiraz, in the sketch, differs no more than a degree and a half, in the bearing from Ispahan, from what we had previously taken it at, yet no confidence can be derived from it.

It was necessary, therefore, to examine the distance on that long line, between Basrah and Shiraz, through Bushire; a line of more than 5 degrees of longitude; but receiving a considerable check by the timekeeper longitudes of Captain Ritchie, taken near Cape Verdistan, to the south of Bushire; and from whence the coast has been traced carefully by Captain M'Cluer. But even if Bushire was placed by celestial observation, the nature of the country between it and Shiraz, two degrees of longitude, hardly allows of any just estimate of the distance, from the extreme ruggedness of a part of it, and the great circuit which the road makes in consequence. But there is nothing better to be had.

The other lines from Waset, Hamadan, (through Nehawend,) and Daurak, &c., are only to be regarded as the best modes of distributing the dis-

tances; and, perhaps, even these appear to agree better than could have been expected.

This article then divides itself into five distinct lines.

1. Ispahan to Shiraz.
2. Basrah to Shiraz; through Bushire and Bender Rik.
3. Waset to Shiraz; through Sus and Shuster.
4. From Hamadan, through Nehawend; and from Oroudghird and Meshid-Feraban; to Shuster and Shiraz.
5. Daurak to Shiraz; through Ragian.

1. *Ispahan to Shiraz.*

In arranging this line M. Thevenot's Journal has principally been followed; as it often gives an idea of the course of the road; which, as well as we could collect, is about S. 15° 30′ E. The distance on this rhumb, between the parallels of 32° 24′ 30″, and 29° 36′ 30″[1], is 173½ G. miles. Thevenot reckoned 66¼ farsangs: Della Valle, 64¾: Thevenot's rate is 2·62 per farsang: Colonel Malcolm, when on the same ground as Thevenot (between Ispahan and Yazdikhast) reckoned 23½, where Thevenot had 24.

Edrisi has 165 A. miles, or 174¾ G. miles; which agrees so nearly with the result of the bearing, that it is probably very near the truth.

[1] The latitude of Shiraz, by M. Niebuhr, is 29° 36′ 37″: and the Oriental Tables give 29° 36′. Colonel Malcolm's party report 29° 34′ 10″. Perhaps, the latter observation may have been made at some place of residence, wide of the city; and the difference not taken into the account.

This road may be divided into three portions: 1, to Yazdikhast, where the *winter* road, (the former being the *summer* road), turns off to the left, and goes circuitously by *Persepolis*, falling into the summer road again at a few farsangs from Shiraz. This first portion lies about SE. by S. and is 24 farsangs. 2, From Yazdikhast to Moyone, 30 farsangs SSE.; and, 3, to Shiraz S. by W. $12\frac{1}{4}$ farsangs.

The longitude of Shiraz obtained by this line of bearing and distance is 52° 48′. The Oriental Tables, generally, have 88°, or 53° from Greenwich; but taken in reference to Kaswin, which is 3° more to the west, 52° 33′; or 15 less than our result. But Tavernier has a table of latitudes and longitudes of places in Persia, that often differs from Nasereddin and Ulegbeg; and which may have been received in a more correct state, than those made use of by Dr. Graves. In the Table, Shiraz is placed in 88° 15′, answering to 52° 48′, precisely; the same as the result of the bearing from Ispahan.

This position also has been found to agree best with those of Sirjan, and other places to the east of Shiraz: and it has been already stated, that the bearing in the sketch of Malcolm's route is only $1\frac{1}{2}$ degree more southerly, which would make the long. 52° 43′ 30″, instead of 48′; or only $4\frac{1}{4}$ minutes of longitude different.

Although the winter road cannot be received from the sketch, as a document of authority, sufficient to regulate the position of Shiraz, yet it is highly proper

to mention the particulars of it, as it is connected with the position of *Persepolis*, and the road to Yezd, &c.

We learn from M. Tavernier, that this winter road owes its formation to very late times. The chain of mountains that crosses the road at Yazdikhast, (and which is the continuation of *Mount Zagros*; that is, the *Median* and *Cossæan* mountains eastward), is with difficulty to be passed in winter; but by cutting a way through a rocky mountain, a passage was effected, by which the more difficult part of the chain of mountains was avoided: and the new road led into that, which goes from Shiraz to Yezd; over which it *returns* to Shiraz, for about 26 farsangs. Tavernier's description, (lib. v. ch. 20), is not very clear; but one may conclude that the new cut was made somewhere about Khoneh-Kergaun.

Colonel Malcolm reckons 49½ farsangs on this road, from its separation, at Yazdikhast, to its reunion with the same road, at 4½ farsangs short of Shiraz; so that the circuit occasions a loss of 16 farsangs, or 56 road miles. Tavernier says two days' journey, which agrees [1].

This road was followed by Mandesloe and Fryer, as well as by Colonel Malcolm and Sir Harford Jones: and appears to have entirely superseded the other, at all seasons. One object, doubtless, is, to visit the remains of *Persepolis*.

It is proper to remark, that the *summer* road is

[1] Dr. Fryer reckoned 54½; Mandesloe, 56½ farsangs; for Malcolm's, 49½.

common both to Shiraz and *Persepolis*, as far as Moyone, and the bridge over the Bend-Emir river *(Araxes)* 9¼ farsangs short of Shiraz; where it turns to the left; or SE. 5 farsangs to *Persepolis* and Istakar. And as it points more towards *Persepolis* than Shiraz, one may conclude that it was the ancient road to that place from *Rages*, &c.

M. Niebuhr, who visited *Persepolis* and its neighbourhood, places Nakshi Rustum, or the Sepulchre of Rustum, N. 43° 30′ E. distant 32 G. miles from Shiraz; and precisely in latitude 30°. The ruins called Chelminar, or *Persepolis*, are 4 G. miles to the south of the Sepulchre. The city itself (for Chelminar was the palace, or temple, or both), may be supposed to have extended far into the plain on all sides. Istakar, a Mahomedan foundation, stood to the NE. of Chelminar; the centre of it probably four or more miles; so that it may be supposed that part of the ground has been common to the sites of both cities.

2. *Line from Basrah to Shiraz.*

Basrah has been already placed in lat. 30° 30′; long. 47° 33′: (see page 55).

In Captain M'Cluer's chart of the gulf of Persia (1787), the coast which forms the west point of the mouth of the Euphrates is too round and indeterminate to be regarded as a geographical point: nor does the opposite side furnish a much better. We have therefore fixed on a spot on the west side, nearly opposite to the eastern point, in lat. 29° 55′; bearing from Basrah, S. 42° E. 45½

G. miles: giving a difference of longitude of 36 min.; so that the spot fixed on is in lat. 29° 55′; long. 48° 9′ [1].

The examination of the extent of the gulf of Persia, at large, belongs to the next part of the comparative geography; and, therefore, we shall confine ourselves here to the line between Basrah and Bushire. But it may be remarked, by the way, that the result of the examination of nine charts of the northern side of this gulf, differs from the charts of Messrs. D'Anville, D'Apres, and Vankeulen; the first of these falling short of the results by a degree and quarter of longitude. But the charts of a date previous to 1717, give at a mean, 50 G. miles of departure more than M. D'Anville's [2].

[1] The course of the Shat-al-Arab, below Basrah, is variously reported, both in bearing and distance: as,

M. D'Anville . .	SE. ¼ E. . . .	45
D'Apres	SE. a little S. .	55
Niebuhr	E. ¾ S. . . .	48½
M'Cluer . . .	S 38° 30′ E. . .	
Edrisi, reckoned to the present Basrah,		47
Thevenot, 18 French leagues:		

Mean Bearing S. 47 E.
Mean, excluding Niebuhr's, S. 43 E.

As Edrisi's distance follows the general course of the river, which is crooked, 1½ is deducted for the winding, and 45½ allowed. M. Niebuhr, doubtless, mistook the general course of the river.

[2] Captain Ritchie's longitude *off* Cape Jask, and to the eastward of it, was 57° 21′ 45″. Our result is 57° 9′. By the expression, one may suppose a few minutes to the E., so that the difference may be only 7 or 8 minutes.

Of the nine charts just mentioned, all of which appear to be the work of persons who had been on the spot, and contributed towards them, are two of Captain M'Cluer's. This gentleman was sent by the Bombay government, for the purpose of surveying the gulf. But the want of celestial observations on shore has left his work less perfect than could have been wished. And this circumstance renders it necessary to enquire, what was the judgment of others respecting the distance; although a preference ought to be given to his, as he possessed more leisure and opportunity.

The mean of seven charts (excluding Captain M'Cluer's), is 130½ G. miles of easting, between the western point of the mouth of the Euphrates, and Bushire, in lat. 29° 2′. M'Cluer's own charts give 136¼; and the mean of all, 133. We have allowed 134 as a mean between M'Cluer and the mean of all the rest; and this easting gives 2° 34′ difference of longitude; which, added to 48° 9′, makes 50° 43′, (or 3° 10′ E. of Basrah), for the longitude of Bushire.

Captain Ritchie had four observations of longitude, by distances of sun and moon, near Cape Verdistan:

28th July, 1785, *just by* the Cape . .	51° 8′ 45″
30th July, a little to the westward of it .	51° 31′
Same day, NW. of ditto	51° 7′ 45″
31st July, north of ditto	51° 8′

Cape Verdistan lies in lat. 27° 57′; and it is thus circumstanced. The coast trends to the north on the one side of it; to the SE. on the other; and a

dangerous reef extends from the point several miles to the SW. So that for a ship to be *just by*, or *very near*, Cape Verdistan, she must have been to the W. or NW. of it; and in such a case, the difference of longitude, from the ship's station to the cape, might be taken at 4 or 5 minutes; and then Cape Verdistan might be in longitude 51° 12′ to 51° 13′. The second observation differs very much from the rest; but even the mean of the four would place the cape only 6 min. more to the east, than the mean of the other three.

If then we take the longitude of Cape Verdistan at 51° 13′; and the difference of longitude between it and Bushire being 29½ westerly[1], that of Bushire by this account will be 50° 43½′, that is, exactly within a fraction of the result from Basrah. But these observations of Captain Ritchie's were not communicated to the author till several years after the construction of the Persian Gulf was completed.

From Bushire to Shiraz, there are three reports of the road distance; besides one from Bender Rik to Shiraz. The three to Shiraz are from M. Niebuhr, Colonel Malcolm, and Captain Franklin. That from Rik, is Thevenot's. There are also maps of the two former routes, which greatly assist in proportioning the direct to the road distance.

Besides the extraordinary circuit that the road takes between Bushire and the ascent of the hills, (see the Maps No. VI. and IX.) there are no less than five ridges of mountains to be crossed, and some

[1] Measured on Captain M'Cluer's chart.

of those of vast height and steepness. This is sufficient to baffle all attempts to gain a true knowledge of the direct distance. But as M. Thevenot's route from Rik to the ascent of the hills is much straighter, it has been called in aid of this part of the work.

M. Niebuhr's map of his route, (Vol. ii.) gives 99·8, say 100 G. miles, between Bushire and Shiraz; although in another map of the Persian Gulf (Descrip. de l'Arabie) there are 108. He adds, that the journey is of six days easy travelling.

Colonel Malcolm allows 49¼ farsangs; of which 31 are between Bushire and Kazerun. And the mean of the three reports of his party was 181½ road miles. Captain Franklin's report is imperfect in respect of the whole distance: but useful in detail, in respect of its particulars.

But as the first 20 farsangs carry them only 40 G. miles from the place of outset, and advances them only 32 towards Shiraz, it will be best to lay that part out of the question, and have recourse to Thevenot's line from Rik.

Kazerun in lat. 29° 38′ 40″ by Malcolm, is, by the mean of five reports, 20 farsangs short of Shiraz. These, on ordinary ground, would be equal to about 2·7 according to Malcolm's scale; producing 54 G. miles direct; but the vastly steep mountains between may be allowed to reduce the distance to 50. Thevenot was 28 hours in a caravan composed of mules; Captain Franklin, 27½. But the ascents and descents are such as to render all calculations of distance, or time, very uncertain. But allowing four

hours to have been lost, the remaining 24 of Thevenot should give nearly 50 G. miles.

The Oriental Tables allow 1° difference of longitude between Kazerun and Shiraz; equal to 52¼ G. miles. On the whole, it would appear that 50 miles direct may well be allowed, between Shiraz and Kazerun.

Between Kazerun and Bender Rik, Thevenot was 33½ hours. Of these, the latter 15 or 16 were in the plains; and 10 to 12 of the others were in the mountains: two ridges being crossed, though less difficult than the other three. If it be supposed that 3½ hours are lost, by delays, on occasion of the ascents and descents, 30 still remain; which, at 2·2, (for the caravan was composed of mules, not camels,) give 66 G. miles of direct distance.

Bender Rik, according to Captain M'Cluer's chart, lies due north from Bushire; and in lat. 29° 29′ 15″. Of course, Kazerun being 9½ to the northward of it; and Shiraz about 2 to the south of Kazerun, there must be an angle at the latter, which will reduce the direct distance between Rik and Shiraz, at least a mile. Therefore, taking the 66 between Kazerun and Rik; and the 50 between Kazerun and Shiraz; the total is 116: from which if 1 be deducted, we have 115 for the direct distance of Shiraz from Rik.

But taking Shiraz at 52° 48′ long., from the result of the bearing from Ispahan (see page 220), the interval on the construction is no more than 109¾, instead of 115: so that the difference is about 5 G. miles only between the two results. And between Colonel Malcolm's bearing and the line from Basrah,

about 9. In effect, it appears to be a very remarkable circumstance, that three results, of such a kind, should agree so nearly. The result, on the bearing adopted by the author, is nearly a mean between the other two: it also comes within a fraction of the longitude given in Tavernier's tables; and differs no more than 5 or 6 minutes from Captain Ritchie's longitude, inferred from Cape Verdistan. And finally, the longitude of Shiraz in Tavernier is in harmony with that of the positions to the eastward of it; as Sirjan, or Kerman, Jiroft, &c. Therefore, until the longitude of Shiraz is decided, by celestial observation, we must be contented with this of 52° 48′. And in order to accommodate the space to this assumed position, we have taken 47 instead of 50; and 62¾ instead of 66, between Shiraz and Kazerun; Kazerun and Rik; respectively. And the direct distance between Rik and Shiraz will then be 109¾; and between Bushire and Shiraz, 115¼, instead of the 100, and 108 of M. Niebuhr [1].

3. *Waset to Shiraz, through Sus and Shuster.*

Waset has been placed in lat. 31° 54′, long. 46° 10′ 15″, in page 59: and its longitude is only 7¼ minutes to the eastward of that given in the Oriental Tables; but the parallel lower by 26 minutes.

There is a most important line of distance in Edrisi, and Abulfeda, from Waset to Shuster (or Tostar), the capital of Khuzistan (ancient *Susiana*), through Teib, Korkub, Sûs, and Jondi Sabur:

[1] The popular estimation of the distance, in farsangs, from Bushire to Shiraz, is 50 to 51 farsangs, of 3½ British miles.

Waset to Teib, 2 days . . .	36 Arabic miles.	Edrisi.
Teib to Korkub, 7 farsangs .	21 ditto.	Abulfeda.
Korkub to Sûs, 10 ditto . .	30 ditto.	Abulfeda.
Sûs to Jondi Sabur, 6 ditto .	18 ditto. . .	Abulfeda, Edrisi, and Ibn Haukel.
	105	

These 105 Arabic miles are taken at 111 Geogr.

Sûs (taken for ancient *Susa),* is given in the Oriental Tables, at 31° 55′ latitude; Jondi Sabur, the same; Teib, at 32°: and although Korkub be given at 32° 15′, yet being on the same road, is probably much in the same line; and we have taken it accordingly. Therefore, a line drawn through these places, from Waset to Jondi Sabur, differs but a fraction of a mile from a right line: and if 111 be laid off from Waset, to the given parallel of Jondi Sabur, 31° 55′, this place will fall in long. 48° 22′. In the Oriental Tables, it is 84° 5′, or 55 min. west of Kaswin; that is 48° 38′, or 16 min. to the eastward of the assumed position [1].

Sûs is given at 83° 40′, or 25 min. west of Jondi Sabur. The distance being 19 G. miles, the difference of longitude on the construction will be 22, instead of 25 minutes.

The position of Jondi Sabur is particularly pointed out, because it is the point of connection between the positions in Media, and those in Susiana.

Shuster is given in the Tables at 31° 30′ lat., 84° 30′ long.; or 30 min. west of Kaswin; that is

[1] If Korkub be placed in 32° 15′, it would reduce the straight line to 106.

49° 3′. Hence its difference of latitude and difference of longitude from Jondi Sabur, will each be 25; making a course of S. 40° W., and about 32 G. miles of distance. But Abulfeda allows 8 farsangs, only; or 25½ miles.

The bridge of Dezfoul, or Dezpool, appears to be 2 farsangs higher up the river (Abzal) than Jondi Sabur; and to the N. or NNE.: and from Dezfoul, Timur is said (by Sherefeddin) to have made a march of 14 hours, to Shuster. For these, 30 G. miles may be allowed; which would give 26 to 27 from Jondi Sabur. These, however, are but small differences; and we have arranged the space between Waset and Shuster, in the following manner.

As the longitudes given could not be adopted, in contradiction to the lines of distance, from authorities that there is no reason to doubt, the parallels are preserved, generally; but the distances preferred to the longitudes [1].

Shuster, therefore, is placed in the given parallel, 31° 30′, and its longitude regulated, generally, by the line of distance from Waset. That line, which runs first through Jondi Sabur, 111 G. miles; and then south-eastward, 26 or 27 miles to Shuster; gives, on the whole, a distance of about 131 miles, *on one line*. This, laid off to the parallel of 31° 30′, gives for the longitude of Shuster 48° 42′, or 21 min. to the west of that given by the Tables. But by some

[1] In these Tables, the latitudes are much oftener right than the longitudes: whether originally so, or that the errors were more easily corrected, from time to time.

mistake, 133 have been laid off, which has placed it in 48° 44′, or only 19 west of the Tables; which, however, is of little consequence. Jondi Sabur has been placed in lat. 31° 52′, instead of 55′, the better to accommodate the distance between it and Shuster; and in longitude 48° 25′.

Ram-Hormos is a town on the road from Shuster to Shiraz, 7 marches of Timur, from Shuster. Here it is proper to observe, that Timur made 18 marches between Shuster and Joyem, a town 16 G. miles short of Shiraz. The interval on the construction is 220 G. miles, (to Shiraz 136,) giving for each march 12·22, or 12¼ G. miles; which is 1¾ above what may be reckoned a *mean* march; and 1′ above the mean of Timur's marches, from Oroudgherd to Jondi Sabur: only that the latter crossed the entire base of the Luristan Mountains; and in the former there was a large proportion of plain.

Ram-Hormos is given in the Tables at 31° lat., 85° 45′ long., or 45 min. east of Kaswin; consequently, in 50° 18′.

If then 7 marches at 12·22, equal to 85½ G. miles be laid off to the parallel of 31° from Shuster, Ram-Hormos will fall exactly in 15° 18′, (or had not the error of 133 for 131 happened, 50° 16′). So that Ram-Hormos takes the position given it by the Tables; and also preserves the proper distance from Shuster: whence we must conclude that the longitude of this latter is faulty in the Tables.

Again, Ram-Hormos is 4° 15′ east of Waset; and 45′ east of Kaswin, in the Tables; and it will be found that on the construction it is 4° 7′ 45″ from the one, and 45′ from the other. And again, that

it is 2° 30′ west of Shiraz, both in the Tables, and on the construction.

Hence, the agreement is very close, whether we regard the differences of longitude, or the distance. That from Waset has already been detailed: and 11 marches of the same length, with the 7 from Shuster, will reach to Joyem; which is 16 G. miles (15 Arabic) short of Shiraz.

Bebehan, at 3 marches beyond Ram-Hormos, 36¾ G. miles, towards Shiraz, agrees nearly the same, in point of longitude; being 1° 25′ east of Kaswin, or in 50° 58′.

Neubendjan, 8 marches from Ram-Hormos, or 97¾ G. miles, is in the Tables 2° 15′ east of Kaswin, or long. 51° 48′, lat. 30° 10′. This place will be found on the construction 7½ min. too far east, in respect of the Tables; or in 51° 55′ 30″. Still, this must be reckoned, in the view of general geography, very satisfactory. And here it is proper to remind the reader, that the Tables, generally, give 88° of longitude for Shiraz, but that Tavernier gives 88° 15′; which latter accords best with all the authorities, whatsoever; and is the longitude adopted for Shiraz. But Neubendjan has its longitude given in respect of the 88° for Shiraz; for the difference of longitude by the Tables, generally, is 45 minutes; and is 48 by the distance above stated.

4. *Nehavend, Oroudgherd, and Karg, or Kurreh, to Jondi Sabur, and Shuster.*

Nehavend, Oroudgherd, and Karg, or Meshid-Feraban, have been already placed, in pages 214, 215.

The lines from these three places, all centre, finally, either in Jondi Sabur, or Shuster; serving to connect the position of Hamadan with Jondi Sabur and Shuster.

Ibn Haukel, Edrisi, and Sherefeddin, (the historian of Timur,) furnish lines of distance; and M. de la Croix, his translator, some latitudes, collected from the Oriental geographers, whose works he had studied. From all these together, the connection between the positions in Irak Ajami, and Khuzistan, is very satisfactorily made out.

What may be deemed the *master line* goes from Nehavend to Jondi Sabur, through Al Assir, or Lashter, and Saberkast; and is given both by Ibn Haukel and by Edrisi; who probably copied him. But the copy from whence Sir W. Ouseley translated Ibn Haukel's work, differs very materially from Edrisi; as will be seen.

Edrisi (p. 206) gives the following route: from Nehavend to Al Assir (the Lashter of Ibn Haukel) 30 A. miles; thence to Allur, or Lour (in Louristan) through Saberkast, 90; and thence to Jondi Sabur, through Andamas, 6: total 126 Arabic miles; or 133½ Geogr. And this is really the space on the construction; Jondi Sabur being placed in 31° 52′.

Ibn Haukel (in the above copy) has the following notices, (page 167): Nehavend to Lashter, 10 farsangs; Saberkast, 12 farsangs; Lour, 30; Andemesh, 2; Jondi Sabur 2: total 56 farsangs, or 168 A. miles; that is, 42 more than Edrisi. It would appear, that he has assigned the 90 miles, or 30 farsangs, of Edrisi, between Al Assir and Lour, to

that between Saberkast and Lour; after having specified the distance between Al Assir and Saberkast, to be 12 farsangs, which should have been included in the 30. Here then are 36 of the 42 miles. Then he gives 4 farsangs between Lour and Jondi Sabur, for the 2 of Edrisi. And there it may be suspected that Edrisi is wrong: and that 2 farsangs, or 6 miles, should be allowed between Lour and Andamas; and the same between Andamas and Jondi Sabur. For Andamas appears to be at the bridge of Dezfoul, which is 2 farsangs from Jondi Sabur; and Lour is a distinct place, and very probably 2 farsangs from Andamas, or Dezfoul. Lour is said by Edrisi to be 2 journeys from Shuster: and Dezfoul has been already taken at 30 G. miles only from it (page 230): so that the 2 journeys are consistent with the 2 farsangs between Lour and Andamas.

Hence we conclude that Edrisi should have added 6 miles to his account. These would certainly increase the given distance, beyond the interval on the construction, by about 3 miles; for Lour and Dezfoul lie at an angle, to the NE.

Timur made 11 marches from Oroudgherd to the bridge of Dezfoul. This space is $123\frac{1}{2}$ G. miles, on the construction; giving a rate of $11\frac{1}{4}$ for each march; which is 1 mile short of his marches from Shuster to Shiraz; and near $\frac{3}{4}$ above the scale of the mean march.

Kurrimabad occurs in this route. This is the *Corbiene* of ancient history, situated amongst the *Cossæi*. Timur made 3 marches to it, from Oroud-

gherd, or 34 G. miles. In the Tables, it stands in lat. 33° 20′, long. 84°, or 1° west of Kaswin. Ibrahim Effendi places it 96 G. miles from Kounsar; so that the longitude agrees exactly, and the latitude within 6 minutes: Oroudgherd being in 34°.

M. D'Anville places Roudbar, or the issue of the waters from Kurrimabad into Khuzistan, at 32 G. miles to the SW. of the town of Kurrimabad. This agrees to the 3 journeys of Tudela from Sûs. The strait of the *Cossæan* mountains must have been in this quarter.

Herbert, in 1628, travelled from Ispahan to Bagdad, by way of Kurrimabad; by far the straightest road. It must have been at a period when the government of Persia was able to subject to order those mountaineers, who, under the ancient name of Cossæans, gave employment to Alexander, in person. For Herbert speaks of no difficulties: he states the number of farsangs to be 130: and from his mode of writing the names of places, it may be supposed that he went by Kounsar, Kurrimabad, Lashter, Nazeret, and Buhris. The trace of the route being 388 G. miles, allows a rate of very nearly 3 miles to a farsang, in direct distance.

It remains, that we should mention Ibn-Haukel's line from Meshed-Feraban to Lour. He names the former *Kurreh;* or as it appears in the translation, pages 168, 169, *Kurreh of Budulph:* meaning the *Karag Abi Dolaf* of Abulfeda and Otter. (See above, page 215). Ibn Haukel allows 6 days between Kurreh and Dehi Lour; as does Edrisi, (p. 206,) between *Karch* and Allur. This will be found to

agree very well; Lour being at the same time 2 days from Shuster.

5. *Daurak; and the lines from thence to Ahwaz, Ragian (or Arjan) and Shiraz.*

Daurak is a fixed point in the geography; the mouth of its river being marked on Captain M'Cluer's chart; and the course of the river itself, to Daurak, in a chart published by Mr. Dalrymple. It is placed accordingly, in lat. 30° 32′, long. 49° 9′; being 79 G. miles east from Basrah. In the Oriental Tables, the lat. is 30° 30′, and long. the same as Kaswin, 49° 33′: but it appears that this place, as well as Shuster, is placed too far to the east, by 21 to 24 minutes.

M. Thevenot says, that it is 3 days' journey from Basrah. The nature of the intermediate country is such, that probably the communication is by water, alone; and, therefore, nothing can be concluded from this report.

Daurak, thus established, is a most useful point of outset, both to the east and west. For Ahwaz and Asker Mokram lie to the NW., and Ragian to the east; and without this fixed point, the whole suite of positions, in the south of Khuzistan, must have remained in a state of uncertainty.

To begin with Ahwaz. There is no positive authority for its position, in respect of Basrah and of Korna, the two nearest known positions. Thevenot reckons it 4 days from Basrah, but this is likely to be by the river navigation, and proves nothing. Its parallel is given, in the Tables, at 31° to 31° 5′;

longitude 84° (but it should be nearer 83°). It is said to be 4 days from Daurak, [to the WNW.] by Edrisi and Abulfeda; as also 3 from Sûs, [S. by W.] and the same from Bayan, a place on the Shat-al-Arab, below Basrah, 24 miles. And, finally, it is 54 A. miles from Shuster, *through* Asker Mokram, which lies somewhat wide, and may shorten the direct distance by a mile and a half, or a mile; that is, the distance between them may be 56 G. miles only.

Now the 76 from Daurak, and the 56 from Shuster, place Ahwaz at 51 from Sûs; 48 from Bayan; although 3 days are given for each of the two latter intervals; that is, 54 to 57 miles. But, in fact, the 51 from Sûs is by no means wide; for $17\frac{1}{2}$ is an ordinary journey, although those of Abulfeda and Edrisi are of 19, when employed in the description of their geography. Therefore Ahwaz appears to be consistently placed, in reference to these three positions, and will stand in 31° 6′ 30″ lat.; long. 47° 45′: although it is 48 minutes more to the east, in the Tables. And it will then be distant from Basrah $38\frac{1}{4}$ G. miles, NNE., and from Korna, the point of conflux of the Euphrates and Tigris, $39\frac{1}{2}$ ENE.

The circumstances of Asker Mokram, in respect of Shuster and Daurak, are these: Asker Mokram is 24 A. miles, $25\frac{1}{2}$ Geogr. from Shuster, and to the westward; because a branch of the Shuster river flows by Asker Mokram, in its way towards Ahwaz. Its latitude in the Tables is from 31° 15′ to 25′; longitude 84° 30′; answering to 49° 3′. And from

Ahwaz it is 30 A. miles, or $31\frac{1}{3}$ Geogr. It is also given, by one account, 4 journeys from Daurak, or 76 G. miles; by another, 66 A. miles, or $69\frac{1}{2}$ Geogr. Both of the reports from Daurak give more than is probable; for 67 is the utmost that can be allowed, to suit the parallel of 31° 25′; and also the space between Asker Mokram and Ahwaz; taking into consideration, also, the distance of Ahwaz from Sûs, which is three journeys. And with respect to the four journeys of Edrisi, from Daurak, 76 miles, the road, most probably, went through Bascian, which lies midway between Daurak and Ahwaz. See the Maps, No. VI. and IX.

We now turn to the opposite quarter, from Daurak, towards Shiraz.

Ragian, or Arjan, is 3 days to the eastward of Daurak; the great southern road, from Ahwaz to Shiras, passing through it, from Daurak. Arjan is situated on the river Tab *(Oroates)*; the present boundary of Khuzistan and Fars, as anciently of *Susiana* and *Persis*. It is said to be one day's journey from the sea; and as Bender Dillam, or Dellim, must be nearly opposite[1], that may be the point intended. The latitude given for Arjan is 30° 30′; but as Dellim itself is in 30°, Arjan cannot be so high. The longitude given is 86° 30′, or 51° 3′, and which, as it falls in 50° 9′ 30″, should probably have been 85° 30′. We have remarked that all the longitudes in this line, in the Oriental Tables, are too far to the east.

[1] By the charts of Captain M'Cluer.

Suk-Sambil, at one day short of Arjan, is given by two authorities at two days from Ram Hormos, which proves, generally, the relative positions of Ram Hormos and Arjan.

Edrisi has a line of distance from Arjan to Shiraz, 130 A. miles, or 137½ Geogr. On the construction, the interval falls 4 or 5 short. Ibn Haukel's line, over the same ground, is confused; but still supplies some corrections of particular stages, and some names of places for the detail.

It may then be allowed, that, as all the different lines of distance extended towards Shiraz, from Ispahan, Shuster, Daurak, and Basrah, together with the deduction from the longitude of Cape Verdistan; vary no more amongst themselves, than about 10 miles in easting; and the Oriental Tables 15 minutes of a degree, or about 13 G. miles: it may be allowed that its position is approximated as nearly as is possible, considering the nature of the materials. Some of the authorities, too, are not only independent of each other, but originate from different quarters. And it appears, on the whole, extraordinary, that the difference amongst the authorities should be so small.

CHAPTER IV.

THE WESTERN QUARTER; OR ASIA MINOR.

THIS tract, although containing less than a fourth part of the surface contained in the *General Map* of *Positions*, has been formed into a separate map of nearly an equal surface with it. For so great a quantity of matter has been collected, and that of so valuable a kind, that the detail could no otherwise have been expressed, in such a manner as to render it the most useful, and also to do credit to the matter itself, and to those who have so obligingly furnished it.

Moreover, certain portions of this geography are given on *still larger* scales, in order to preserve the value of materials, that would be very considerably deteriorated, by being shewn on a lesser scale, and, of course, become less useful in the construction of future maps, on a more extended scale than ours.

Not only the visits of Europeans (chiefly English) have been more frequent to Asia Minor, in later times, but they have traversed it in new directions, and have explored situations which were unknown, otherwise than in books, to former geographers. The quadrant and compass have also been employed in

the interior; and, to the honor of the French Academicians, the whole southern coast of the Euxine has been traced in a general way, and a great number of points in it determined by celestial observations of longitude, as well as of latitude [1]. And,

Celestial Observations in Asia Minor, &c.

Names of Places.	Lat.	Long. Greenwich.	
	° ′ ″	° ′ ″	
Adana	36 59	.	
Aleppo, or Haleb . .	36 11	. 37 9	. *
Amasarah	41 46	. 32 21 15	. T.K.
Arakali	41 18	. 31 29	. { * Adopted 31° 25′
Asian Castle (Dardan.) .	40 9	. 26 19	. *
Auniah, or Unieh . .		. 37 12 40	. T.K.
Baba, Cape †	39 33	.	. { Captain Stewart
Balikesr	39 42	.	
Bartin river mouth .	41 43	. 32 11	. T.K.
Beer	36 59		
Bergase, or Bourgas .	40 14 30	. 26 27	. *
Brusa	40 9 30		
Constantinople (Serag.) .	41 1 30	. 28 55	. *
Cyzicus	40 22 30		
Demir-Kapi	39 49		
Diyarbekir	37 55		
Erekli (by Kuniga) . .	37 30		
Erzerum	39 56 30		
Gallipoli	40 25 30	. 26 37	. *
Ghinuk	42	. 33 52 15	. T.K.
Jenisheht	40 12		

† More probably the point of *Polymedium*, to the SE. of Cape Baba, as it forms the extremity of the land to the *right*.

finally, M. Niebuhr collected generally, through Asia Minor, details of the principal caravan routes; besides noting the line of the great southern road, which he himself travelled. All these together form a vast mass of geographical matter, worthy of being placed on record.

Names of Places.	Lat.	Long. Greenwich.	
Kadaros	41° 52′ ″	32° 51′ ″	T.K.
Karahissar (Aufium)	38 46		
Kefken		30 13 20	T.K.
Kizil Irmak, Cape	41 33	36 5 15	T.K.
Kuniyah	37 52		
Manessa	38 41 30		
Merdin	37 19		
Nicomedia (Isnikmid)	40 45		
Nicæa (Isnik)	40 21 30		
Oulubad, or Libad	40 10 30		
Scandaroone	36 35	36 14	*
Sharshamba, Cape		36 21 15	T.K.
Sinub	42 2	35 6	* Adopted 35° 1′
Smyrna	38 27	27 7	*
Soverik	37 46		
Tarsus	37 1		
Trabezon (Trebizond)	41 2	39 37	* Adopted 39° 28′ 30″
Lampsacus	40 21	26 36	*
Kutahiah	39 25		* Adopted 39° 22′
Antioch	36 12		
Kanzir Ras, or Cape Hog			Galiano & T.K.
Tarapia	41 8 24	29 0 30	*
Vona, or W.	41 6 30	37 39 15	

* Celestial observations for the longitude.
(T.K.) Time-keeper observations.

The different places of celestial observation, on the southern coast of the Euxine, form as many points of outset, for lines of distance, to the interior, whilst they are themselves connected together, by M. de Beauchamp's tracings of the intermediate coasts. The only exception in this last respect is between the *Bosphorus* and *Heraclea* of Pontus, which has been supplied partly from other sources.

This *fourth division* of the geographical construction is divided into nine separate articles, answering to the different lines of construction, on the maps of positions, No. IX. and X., from 14 to 22 inclusive.

SECTION XIV.

Positions around the southern and eastern shores of the Sea of Marmora, (or Propontis,) from Constantinople to Mahalitch, through Nicomedia, Nicæa, Jenishehr, and Brusa[1].

From the tower of Galata, Mr. Hammer found the centre of the highest part of Mount Olympus to bear S. 12° E., allowing $11\frac{1}{2}$ degrees for westerly variation, in 1804[2]. Mr. Browne found *the same bearing*, from the mosque of Suleiman.

[1] This refers also to the line, No. 14, in Maps No. IX. and X., and to letter F. in No. XII.

[2] M. de Beauchamp found 12° 33′ of variation, at Constantinople, in 1797; so that, in 7 years, it appears to have decreased

The tower of Galata is situated about three quarters of a Geogr. mile to the NW. of the centre of the Seraglio; and the mosque of Suleiman about 1 mile to the W. by S. of it. Hence the two places of observation may be said to be only $\frac{3}{5}$ of a mile from each other, as it respects the lines of bearing; that being the space *subtended* between the two lines; and these being alike (S. 12 E.) would of course occasion a difference of just $\frac{3}{5}$ of a mile between the two results. As the summit was the clearest of the two, when Mr. Hammer took the bearing, his is preferred. M. Kauffer allowed S. 11° 45′ E., and M. D'Anville S. 10° E. nearly. Its *parallel* is determined by deduction from that of Brusa.

From the summit of Olympus, Mr. John Hawkins and Mr. Hammer severally took bearings, at different times, of various surrounding objects, which are generally detailed in Map No. XII. letter F. Mr. Hawkins also took bearings at a *second* station, at the mouth of the Mahalitch river: and from thence drew a bearing line to the towns of Mahalitch and Oulubad, or Libad. From these and other bearings, collectively, and the latitudes taken, the following information is to be collected:

1st. That Brusa bears N. 40° W.[1] from the summit of Olympus, distant 7 G. miles (carefully com-

more than a degree. It is universally on the decrease, between Europe and India.

M. de Beauchamp found, at Trabezon, in the same year, $8\frac{1}{4}°$, and $10\frac{1}{3}°$ at Sinope.

[1] All the bearings are understood to be clear of variation.

puted); whence Brusa being in the parallel of 40° 9′ 30″, by Mr. Browne's observation, that of the summit of Olympus must be in 40° 4′. And the line of S. 12° E. from Galata cuts this parallel at 11·4 G. miles east of the Seraglio, whose longitude is taken at 28° 55′ E. of Greenwich. And hence, Brusa itself is calculated to be in lon. 29° 4′.

2d. That Oulubad bears W. 12° N. from Olympus, and at 26½ G. miles (12 caravan hours at 2·2) from Brusa, which line serves as a *base* for Olympus; and added to the 7 miles from Brusa to Olympus, becomes a new *base* for Bozboroun and the mouth of the Mahalitch river. Oulubad then stands in lat. 40° 10′ 40″; and by Mr. Browne's observation is in 40° 9′ 30″.

3d. The mouth of the above river bears W. 32° N. from Olympus, and N. 14½ E. from Oulubad. Mr. Hawkins's line passed through Mahalitch, which is NW. 2·8 from Oulubad, S. 19° W. from the river's mouth. These intersections fix the station at the latter place, from whence Mr. Hawkins took the bearings of the different objects to seaward, as expressed in No. XII. letter F.

4th. Bozboroun is placed by the cross bearings from Olympus and the river's mouth, as in the plan[1]. The same of Kalo-Limno island.

5th. Ghio, or Gemlek, seen from Olympus, bore N. 3° E., and is 12 G. miles N. 17° E. from Brusa.

6th. Moudania, NW. from Brusa, 14½ G. miles.

[1] Messrs. Hawkins and Hammer agreed precisely in their bearings, though they were taken at different periods.

7th. Apollonia, in an island, in the lake, W. 13° N. from Olympus, 6½ hours, or 14¼ G. miles from Brusa.

8th. The eastern extremity of the *Propontis*, seen over the land, bore N. 12° E. This appears to be the part where the gulf of Nicomedia begins, and agrees well to the construction.

9th. The mountain of Tamonedje, or Tumanidge, bore S. 1½° E. A remarkably lofty mountain, of a semicircular form.

10th. A mountain, answering to Denni-Kapi, W. 18° 20′ S.

These are the principal of the positions dependant on the bearings, from these stations. It should be mentioned, that Kauffer's bearing of Bozboroun from Constantinople differs only 1¼° from our construction, and Kalo-Limno half a degree. The great error of his map is, that he places the southern coast of the *Propontis* much too far to the south, as well as Olympus and Brusa.

Mr. Browne took a series of bearings, and kept his time regularly from Brusa, to the gulf of Nicomedia, at Hersek, along *both sides* of the lake of Nicæa; taking also the latitudes of several places.

Jenishehr he places E. ½ N. from Brusa; distant 12 hours, or 30 G. miles, at the rate he went. Its latitude is 40° 11′.

Nicæa, now Isnik, he states to be N. 14½ W., 4½ hours from Jenishehr, and its parallel 40° 21′ 30″. This position differs only a mile and a half from the result, arising from the calculated bearing from Scu-

tari, (see No. X.) which was S. 40° E. It is also reckoned 23 to 24 hours from Constantinople; $12\frac{1}{2}$ from Brusa; $9\frac{1}{4}$ from Gemlek; and all those lines fall in within a like space [1].

Mr. Browne has another line from Hersek to Nicæa, S. 33° E., $9\frac{1}{2}$ hours, which is also consistent (see Map. No. X.); as also a most important one from Brusa to Karamousal, N. 31 E., $15\frac{1}{3}$ hours direct.

Nicomedia, or Is-Nikmid, is placed by the mean of *a great number* of modern reports of its distance from Scutari, at 41 G. miles, or 19 hours, and its latitude by Mr. Browne is 40° 45′. Unfortunately there is no cross bearing to check its position, in respect of longitude. Mr. Hammer, who went to it

[1] Constantinople to Nicæa, or Isnik.

	Hours.	
Seetzen . .	23	Mean $23\frac{1}{2}$
Niebuhr . .	24	
Leake . . .	23	
Baldwin . .	$23\frac{1}{4}$	
Jones . . .	23	
Hammer . .	25	

Bearings and distances from Scutari.

		G. miles.
Scutari to Gebissa .	E. 41° S.	22·35
Hersek	S. 39° E.	6·2
Kizderbend . . .	S. $37\frac{1}{2}$° E.	11·65
Bojaluk	S. $15\frac{1}{2}$° E.	6·0
Nicæa	SE.	5·9
General bearing .	S. 40° E.	51·2
Carlyle	21 hours,	2·6—52·6

from Nicæa, could not ascertain the bearing [1]. Kauffer gives the latitude at 40° 43′.

The three ancient sets of Tables give, at a mean, 62 Roman miles between Constantinople and Nicomedia; equal to 44¼ G. miles direct; but as they all passed through *Libyssa* (as at present), the *detour* was very considerable, and 41 cannot well be considered as too low.

The point of Dil, opposite Hersek, was set by Mr. Hammer, from the hill of Nicomedia, W. 11½° S.; proving Kauffer's general result.

The breadth of the *land*, or *isthmus*, between Nicomedia and Aghoa, is given by Mr. Hammer at 8 hours, which may be taken at 17 G. miles.

Thus the principal positions on the E. and SE. of the *Propontis* are fixed, and with more accuracy than could reasonably be expected, owing to the ardent zeal of Messrs. Hawkins, Browne, and Hammer. These positions, moreover, are of more importance to the geographical construction than may

[1] Constantinople to Nicomedia.

	Hours.	
Vizier . . .	19	Mean about 19.
Vaughan . .	19¼	
Hammer . .	19½	
Browne . . .	18	
Howel . . .	20	
Sestini . . .	18	
Otter . . .	18½	

The point of outset is Scutari, on the opposite side of the Bosphorus, to Constantinople, and bears E. 7½° N., 1¾ G. miles, from the point of the Seraglio.

readily be supposed: for they respectively [1] serve as points of outset to all the principal roads of Asia Minor, and being described in detail, they may hereafter be of great use in improving the geography on a more extended scale [2].

SECTION XV.

M. Niebuhr's line, through the southern part of Asia Minor.

M. NIEBUHR's line through Asia Minor, (like that through Syria and Mesopotamia,) may be regarded as a kind of *master line* in the construction; since it contains several observations of latitude, and has its parts regularly connected with each other, by means of latitudes and compass bearings [3].

Unfortunately, a portion of the line is wanting, between Misal and Brusa (about 36 miles). It is, however, very amply supplied by Mr. Browne, who took a series of bearings, with a few latitudes, from Brusa to Tarsus. We shall, therefore, adopt his

[1] That is, Nicomedia, Nicæa, Jenishehr, Brusa, Oulubad, and Mahalitch.

[2] A map of Ionia, Æolis, the Hellespont, and Propontis, &c., on two sheets, is in progress, but materials are still wanting.

[3] M. Niebuhr's latitudes in Asia Minor are,—Adana, 36° 59′; Erekli, 37° 30′; Kuniyah, 37° 52′; Karahissar, 38° 46′; Kutahiah, 39° 25′; and Brusa, 40° 12′.

authority between Brusa and Kutahiah, the first place of observation of latitude that occurs next to Brusa.

Kutahiah (regarded as the capital of Anadoli) is in latitude 39° 25′, by M. Niebuhr, who also gives 40° 12′ for Brusa, which, by Mr. Browne, is 40° 9′ 30″. And this latter being the most in harmony with the other observations and bearings around, we adopt it accordingly. And on a supposition that M. Niebuhr may be too far northerly also at Kutahiah, 39° 22′ is substituted for 39° 25′.

Mr. Browne's bearing between Brusa and Kutahiah is E. 37° S. (variation allowed; as in all other cases, when the contrary is not mentioned); and distance 30 hours. But these are not hours' travelling of a caravan, of about 2¼ G. miles; but of a small party, where the rate may be taken at 2·6, or 78 G. miles, had the road been like the ordinary ones; but this road not only makes a great bend to the east, but *coasts*, and *crosses* the great ridge connected with Mount Olympus: (whence 70 have been deemed sufficient).

But as it is obvious that no bearings taken in this way can be depended on, to two or more points of the compass; and as Kutahiah is situated so deep within the country, in respect of the shores of the Archipelago, and Euxine; and has so many public roads converging towards its neighbourhood, it becomes of importance to render its position as correct as possible.

It happens in this case, that there are on record several distinct reports of distances (caravan routes),

between Smyrna, Scanderoone, and Anguri, which may be made use of, as *cross distances,* to check the position of Kutahiah, and other places immediately connected with it. And moreover, Kutahiah itself is so connected with Aufium-Karahissar, and Jaurkoi, (through which places the Anguri and Syrian caravans pass), by means of a triangle, formed by the three; that nothing could be more convenient. It will therefore be necessary and proper, in the first instance, to connect Kutahiah with these two places: and afterwards to arrange the distances between the latter, Smyrna, and Scanderoone. And this being done, Kutahiah will take its proper position, in respect of Brusa, and the stations around it, in Asia Minor, in general.

Karahissar, by M. Niebuhr, is in latitude 38° 46′, and bears from Kutahiah, on a *mean* of the two reports of Messrs. Niebuhr and Browne, S. 21 E. And the difference of latitude being 36′, the distance given on the *Rhumb* is 38½ G. miles. Mr. Browne allows 14½ hours; which at 2·6, is 37¾, and may be said to agree perfectly. M. Niebuhr, by the great obliquity of the bearing, which he supposed, allows no less than 46. But it is proper to remark, that all M. Niebuhr's distances are in excess; proved by the difference of longitude. In Syria and Mesopotamia, &c. in the proportion of 2 in 27; and in Asia Minor, 2 in 25. Consequently the 46 would, by this rule, be reduced to about 42⅓.

Jaurkoi lies to the SW. of Kutahiah; and to the WNW. of Karahissar: 12 hours from the former;

16 from the latter [1]. These hours are of the caravan rate, at $2\frac{1}{4}$ G. miles, or under [2]: and accordingly, Jaurkoi is taken at $26\frac{1}{2}$ G. miles from Kutahiah, 35 from Karahissar. The distance between Kutahiah and Karahissar will then be the *base*, and these two lines, the other two sides of the triangle, to place Jaurkoi.

Jaurkoi is given by the mean of three reports, at nearly 58 hours to the eastward of Smyrna [3]. But as Sardis, (which occurs in this line) is placed separately, by a variety of other authorities, combined, (see Article 20,) we shall here take it at 18 of those hours, or 41 G. miles, which leaves 40 hours for the interval between it and Jaurkoi. And these, at the above caravan rate, will give about 90 G. miles from Sardis; or 131 from Smyrna.

We turn next from Jaurkoi and Karahissar, towards the opposite quarter, of Scanderoone.

[1] Jaurkoi to Karahissar:

	Hours.	
Niebuhr	14	Mean 16 hours.
Uskoe	17	
Seetzen	$17\frac{1}{4}$	
. . .	16	

The 12 from Kutahiah are thus made out: Kutahiah is 20 hours from Ushak; and Jaurkoi is 8 hours from Ushak, in the direction of Kutahiah.

[2] This rate is taken on a number of caravan routes, collected by M. Niebuhr. See the Introduction.

[3] Smyrna to Jaurkoi:

	Hours.	
Niebuhr	57	Mean $57\frac{2}{3}$ hours.
Uskoe	59	
Seetzen	57	

It will appear by a reference to the discussion of the positions around Aleppo (or Haleb), page 5, that Scanderoone is taken at 46 G. miles to the west of Aleppo; latitude 36° 35′. And again, in the discussion of the Syrian and Cilician passes, that Adana, in lat. 36° 59′, is 40 such miles west of Scanderoone. Our present enquiry is accordingly limited to the space between Jaurkoi and Adana. And as the distance between Jaurkoi and Karahissar has been stated above at 35 G. miles: we are still farther restricted to the space between Karahissar and Adana.

M. Niebuhr's line between Scanderoone and Karahissar gives 330 miles, whilst the construction has no more than 303½. Of course, there is an excess in the distances *here*, in the proportion of about 2 in 25. (In Syria and Mesopotamia it was about 2 in 27.) And as the line is oblique, to the northward of west, his bearings will all, of course, be *more northerly*, by the shortening of the distance, whilst the difference of latitude remains the same.

This being the case, it is absolutely necessary that the distance in hours should be adopted, for the better distribution of the distance; whilst M. Niebuhr's latitudes and geographical matter, in detail, will preserve their original value, under the new distribution.

Accordingly, we have taken the mean of several reports from good authority, and apportioned the distances on such intervals, as appeared the most proper for the purpose. And they are as follow: 1. Karahissar to Sakli; 2. thence to Kuniyah, or Iconium; 3. to Erekli; and 4. Erekli to Adana.

It will be proper to consider the last of these intervals first. The reason is, that because of the roughness, the intricacy of the way, and the great circuit that it makes, (in crossing the region of Taurus, of more than 20 hours' travelling,) it required a separate discussion. The whole time between Erekli and Adana is given at 41 to 42 hours[1]; but by the best allowances that we have been able to make, the *direct* distance cannot well be more than 78 G. miles; which is about 14 less than an equal number of hours would have produced, over ordinary ground.

It appears then, that between Karahissar and Erekli, the following time is allowed; taking the mean of 3 to 5 different authorities:

	Hours.
Karahissar to Sakli	$15\frac{1}{2}$
Sakli to Kuniyah	$32\frac{1}{4}$
Kuniyah to Erekli	$32\frac{1}{2}$
	$80\frac{1}{4}$[2].

---

[1] Erekli to Adana:

	Hours.	
Vizier	46	
Jones	40	
Seetzen	42	Mean $42\frac{1}{3}$ hours.
Otter	41	
Hammer . . .	42	

Better to reject the first, and take $41\frac{1}{4}$.

[2] Karahissar to Sakli:

	Hours.
Seetzen	$15\frac{1}{2}$
Niebuhr	$15\frac{1}{2}$
	$15\frac{1}{2}$

These, at $2\frac{1}{4}$ G. miles, produce $180\frac{1}{2}$ G. miles, *measured through the different places*, and not in one *direct* line; although the road has no *great* inflexions in it, between these places. Taken *direct*, from Karahissar to Sakli, thence in the same manner to Kuniyah, and finally to Erekli, the distance is $178\frac{1}{2}$. And if measured on the construction through the principal places, in detail, it is 181, when Jaurkoi and Karahissar are placed, according to what is said in page 251.

From all that has been said, it will appear, that the *time* between Smyrna and Erekli, through Jaurkoi and Karahissar, is 154 hours[1]; which, taken

Karahissar to Sakli . . . . $15\frac{1}{2}$ hours.

Sakli to Iconium (Kuniyah).

	Hours.	
Seetzen	32	Mean $32\frac{1}{4}$ hours.
A second account .	32	
Vizier	31	
Jones	32	
Otter	32	

Kuniyah to Erekli:

	Hours.	
Seetzen	32	Mean $32\frac{1}{2}$ hours.
Niebuhr	32	
Hammer . . .	32	
Jones	34	

Total . . . . . $80\frac{1}{4}$ hours.

[1] Smyrna to Erekli, through Jaurkoi:

	Mean.
Smyrna to Jaurkoi, (p. 252).	$57\frac{2}{3}$
Jaurkoi to Karahissar, (ditto)	16
Karahissar to Erekli, as above	$80\frac{1}{4}$
Nearly	154

at M. Niebuhr's scale, throughout Asia Minor, 2·23 G. miles, gives a total of 343½ G. miles: whilst it will be found, that the distance measured on the construction, through the same points, is 347; or only 3½ more: and which would just give a rate of 2¼; the rate assumed between Smyrna and Jaurkoi. And accordingly, that by assuming the same rate, between Jaurkoi and Erekli, the former will stand in its due proportion of distance to both: that is, at 131 G. miles from Smyrna; 216 from Erekli.

We come now to the application of this result, to Kutahiah and Brusa.

It has appeared in page 251, that Karahissar *(Aufium)* is taken at S. 21 E. from Kutahiah, distant 38½ G. miles; and that its parallel by observation is 38° 46′. In the position that it now takes, according to the result of the examination, at 35 G. miles to the south-eastward of Jaurkoi, its longitude will be 30° 28′ 40″, (and Kutahiah in 30° 11′): in which position its bearing and distance from Brusa will be E. 42° S. 70 G. miles, instead of Mr. Browne's original bearing and distance of E. 37° S. 78. But we regard the difference of bearing, taken in such a way, as very trifling indeed. And that, on a line of distance of nearly 350 miles, a point near the centre of it should be so well arranged by computation, as to agree within a few miles, in distance, and a few degrees in bearing, with a separate result, proceeding from a different, and remote quarter; is very remarkable.

It must then be admitted, that these *three points* of Kutahiah, Karahissar, and Jaurkoi, in which, col-

lectively, almost all the great roads in the western quarter of Asia Minor centre, are fortunately placed; since there is no one celestial observation for the longitude, throughout its whole extent, inland. And it will be found, that they are equally in harmony with Anguri, to the north-east.

At Kuniyah *(Iconium)*, in the same line, all the western roads from Constantinople to Ephesus finally centre. The parallel of this place is therefore a very useful acquisition: and it will be found in the sequel, that the distance between it and Smyrna is as satisfactory as that from Constantinople; of which we have been treating.

It is not unworthy of remark, that Kuniyah is exactly midway between Brusa and Aleppo, Constantinople, and Ghinuk, on the coast of the Euxine; all placed by celestial observations for the longitude; or by time-keepers.

Thus we have apportioned the distances on this line; which may be regarded as a kind of BASE, or SERIES of BASES, through Asia Minor; throughout its whole extent: since the time is collected from the mean of several different authorities; and that observations of latitude occur, in five intermediate places, between Scanderoone and Brusa. Moreover, three points in the line are checked by cross lines of distance. And, in effect, it contains a great number of fixed stations, from whence other lines of distance may be set off.

SECTION XVI.

Mr. Browne's *Line from Haleb (Aleppo) in Syria to Constantinople, through the heart of* Asia Minor.

Mr. Browne's line passes to the northward of M. Niebuhr's, at the distance of 60 to 100 miles; leading through the important (geographical) positions of Aintab, Kisariah, Anguri, Bekbazar, and Nicomedia. Or, as Aintab is a position well ascertained by Drummond, the line may be reckoned to commence there. (It lies 25 hours, by Mr. Vaughan, to the northward of Aleppo). And as Nicomedia has also been placed (page 247), his line may be allowed to terminate there.

The line then *divides itself* into three nearly equal portions: 1. between Aintab and Kisariah; 2. between Kisariah and Anguri; and 3. between Anguri and Nicomedia.

Mr. Browne calculated his general bearing between Aintab and Nicomedia at W. 25° 30′ N.: and on the construction, it is W. $31\frac{3}{4}^{0}$ N.; differing no more than $6\frac{1}{4}$ degrees; a small error, in a line of nearly 500 British miles: and shews what may be done for geography, in this way. The *mean* rate of travelling, on the whole line, reduced to *direct* distance, is 1·826 per hour: a very slow rate [1]. Allowance, however,

[1] Not but that there are others that rise but little above it: and one falls *below* it.

has been made, in cases where the nature of the surface, to any extent, differed from the generality.

The mode in which the positions have been corrected, and adjusted, is as follows:

Kisariah, by Mr. Browne, was $76\frac{3}{4}$ hours from Aintab; on a bearing (clear of variation) of W. 44° 50′ N., or say, north-west. This falls at 107 G. miles to the north-eastward of Erekli, in M. Niebuhr's line; but as Paul Lucas, who travelled the road between them, allows no more than 44 hours; and M. Niebuhr was told by the caravan people, that it was only 41; it is evident that Mr. Browne's bearing line is too much to the north of west. As the road is in part circuitous, no more than 85 G. miles, in direct distance, can well be allowed. This makes a difference of about 9 degrees in the bearing.

That this *ought* to be its general position, appears from two circumstances: Tournefort was told that it was 6 caravan journeys from Tokat; and it appears by the construction that the distance *(direct)* is 106 G. miles; equal to $17\frac{2}{3}$ *per* day[1]. And Abulfeda allows 7 journeys between *it* and Kuniyah, through Akserai, which is supposed to lie directly between them. The 7 journeys are to be taken at $133\frac{1}{2}$ G. miles[2]; which is actually the interval on the construction.

If Akserai should lie out of the line, in any degree, Kisariah, of course, may be *nearer* to Kuniyah, but

[1] This rate is a full mile above caravan rate, *per* day.

[2] See the preliminary article to the Geographical Construction.

cannot be *farther off*. Thus placed, its latitude is 38° 32′, longitude 35° 6′ 20″.

Anguri *(Ancyra)* is given by Mr. Browne at W. 35° 5′ N. 72½ hours from Kisariah. This bearing is also too much northerly, but in a less degree than the *former*, which crossed the mountainous regions of Taurus and Anti-Taurus, and was more subject to error: it falls at 133 G. miles from Kuniyah.

It is fortunate that a position so centrical to the northern quarter of Asia Minor, can be placed with so much satisfaction; since there are lines of distance to it, from *Heraclea* of *Pontus*, on the Black Sea, and from Kuniyah, Ladik, Karahissar *(Aufium)*, and Eski Shaher, on the inland side. All these have a near agreement with each other; and with Mr. Browne's proportional distances from Kisariah and Nicomedia.

From Kuniyah, Anguri is 55 hours, according to Paul Lucas: these, at 2·23, give 122½ G. miles. Edrisi allows 6 days; say 114 such miles, from Ladik; which goes about 6 beyond the former. Dr. Pococke reckoned it 110 from Arakali *(Heraclea)* through Keredy, which lies *nearly* in a direct line between: that is, 54 from Keredy to Heraclea; 56 to Anguri: this falls 3 only *beyond* (to the SE. of) Lucas's, which is highly satisfactory; since all the three differ amongst themselves only a *very few* miles. To these authorities, though of less value, are Tournefort's line, from Anguri to Eski Shaher; and that of Dr. Pococke, from Karahissar; both of which have a general agreement with the spaces on the construction.

Anguri is accordingly placed at a mean between the two reports of Pococke and Lucas, preserving Mr. Browne's proportional distances from Kisariah and Nicomedia. In this position it is 15½ G. miles to the south-westward of the point given by Mr. Browne's original bearing from Kisariah; and the difference in the angle of bearing is 7 degrees. Lat. 39° 50′, long. 32° 45′ 30″.

Nicomedia, (or Is Nikmid) Mr. Browne reckoned W. 5°½ N. 81 hours from Anguri. It appears, however, that the bearing is W. 21° 15′ N.; so that the difference is no less than 15¾ degrees in the angle. And it is to be remarked, that this difference lies in a different direction from the two former; that from Aintab to Kisariah being too much to the right, or northward, of the line, by 7 to 9 degrees; but this latter 15¾ too much to the left, or southward; but the errors nearly balancing one another, the difference on the whole is only 6¼ to the southward.

Bekbazar, or Begbazar, is a point in the line between Anguri and Nicomedia, at 20 hours, taken at 38½ G. miles to the westward of the former: and from whence the great caravan routes turn off to Brusa and Smyrna. As there is a line of distance on the latter road, falling into the position of Jaurkoi, above commemorated, it may be proper to examine it in this place, as it strengthens the authority of the position of Anguri[1].

[1] The detail of Mr. Browne's routes, as well in this, through the body of Asia Minor, as in that between Smyrna and Brusa, is preserved on the map of construction, No. X., where each

SECTION XVII.

Line of the caravan route from SMYRNA *to* ANGURI.

FROM Smyrna the mean of the different reports gives about 109 hours to Begbazar[1]; 20 thence to Anguri; but as Begbazar is a station ascertained by Mr. Browne's line; and Jaurkoi has been already fixed in Article XV. the present consideration regards the space between Jaurkoi and Begbazar only. However, it may not be amiss just to take notice, that the 109 hours to Begbazar, at $2\frac{1}{4}$ G. miles, produce $245\frac{1}{4}$ such miles; and that the space on the construction, measured *through* Jaurkoi, is 247; but *direct*, 244; that place lying a little to the SE. of the line, and occasioning a difference of 3 miles. More need not be said in respect of the general agreement of the materials with the construction.

The caravan road from Smyrna and Jaurkoi to Begbazar passes 6 or 7 miles to the SE. of Kutahiah; and thence through Seid-al-Gazi, a town situated on the great road from Constantinople to Syria: whence an opportunity offers of checking the

separate line of direction, and each number of hours, are inserted.

[1] *Smyrna to Begbazar, through Jaurkoi.*

Niebuhr to Jaurkoi . .	57	109 hours.
To Begbazar	52	
Uskoe to Jaurkoi . .	59	108 hours.
To Begbazar	49	
	Mean	$108\frac{1}{2}$

positions on both roads; they crossing one another at right angles. And from Seid-al-Gazi, it proceeds to *Bosan,* or *Poson,* (taken for *Pessinus),* and finally to Begbazar.

The distance between Jaurkoi and Begbazar is about 51 hours at a mean; which, at $2\frac{1}{4}$, give $114\frac{1}{4}$ G. miles, which space will be found to agree precisely with the construction. And of the 51 hours, $22\frac{1}{2}$ are between Jaurkoi and Seid-al-Gazi; $28\frac{1}{2}$ between that and Begbazar [1].

The line from Smyrna to Anguri is the strongest proof possible (of the kind in question) of the just position of Anguri in respect of the surrounding positions; for when regulated in point of longitude, by the proportioned distance between Syria and Constantinople; and in point of parallel, by distances from Heraclea and Iconium in opposite quarters; a line of distance from a totally different quarter, that is, Smyrna and Jaurkoi, agrees with it.

[1] *Jaurkoi to Begbazar.*

Niebuhr.	Hours.	Uskoe.	Hours.
Jaurkoi to Zalkoi	8	Jaurkoi to Zalkoi	6
Dugar	8	Dour	8
Ilme Bajas	7	Seid Gazi	8
Araburen	6		
Dogan Ugli	9		
Bozan	3	Bozan	10
Begbazar	8	Assi M.	8
		Begbazar	9
	52		49

See also the note at page 262.

Here it is proper to mention Dr. Pococke's line from Karahissar to Anguri.

His general distance was 53 hours, or 7 ordinary journeys. Another report by Mr. Hammer has 56 hours. The mean, $54\frac{1}{2}$, at M. Niebuhr's mean rate of 2·23, would give $121\frac{1}{2}$ G. miles; and there are 124 on the construction. The 7 journeys, at $17\frac{1}{2}$ give $122\frac{1}{2}$ [1].

The bearing of Dr. Pococke's is also consistent. He estimated it at ENE. and the construction has E. 30. N.

SECTION XVIII.

Line from NICÆA *(Is-nik) to Sakli; a portion of the great road from Constantinople to Syria.*

THE position of *Nicæa* has already been fixed amongst those around the Propontis, in Article XIV.; as also Jenishehr. This line passes through Eski-shaher, or *Dorylæum*, and is one of the most public and frequented roads in Asia Minor. It falls into the roads from Smyrna and Brusa, at Sakli (called

[1] Sevri-hissar and Eski-Yuldutch arise in this line of Dr. Pococke's; the former at 24 hours from Karahissar; and having the ruins of Balkissa, *(vulg.* Balhazar) at two hours to the SE. of it. This is taken for the site of ancient *Amorium*. Eski-Yuldutch is midway between Karahissar and Sevri-hissar: and at three hours to the SE. of it is Herjan, where are ruins that are taken for those of *Synnada*.

also Seleukter); those roads having previously united at Aufium Karahissar, which is about 2 journeys to the west of Sakli. And from this point, the Constantinople, Brusa, and Smyrna roads to Syria are united.

The first stage beyond Nicæa, is Lefke, 7 hours[1]. Although the general course of the road under consideration is south-eastward, yet this station lies very little to the S. of east: as is proved by its distance from Yeywa to the NE.; which is no more than 10 hours, although it leads circuitously through Akhissar. But from Lefke the road turns several points more southerly [2].

From Lefke[3], thus placed, Sakli is, by the mean of

[1] *Nicæa to Lefke.*

Niebuhr	9 hours.	
Pococke	6	mean, nearly 7.
Baldwin	6	
Jones	6	
Seetzen	7	

[2] The obliquity of its position is probably owing to its being a common point in the two roads to Anguri and Syria.

[3] *Lefke to Sakli, through Eski Shaher.*

Seetzen	22 to Eski Shaher.	
Vizier	20	mean, $20\frac{1}{4}$ hours.
Hammer	18	
Leake	21	
Seetzen	45 to Sakli.	
Vizier	36	mean $35\frac{1}{4}$
Leake	34	
Niebuhr	33	
Otter	35	
Baldwin	38	
Lefke to Sakli	$55\frac{1}{2}$	

four reports, $55\frac{1}{2}$ caravan hours. On the construction, 123 G. miles are found; agreeing with M. Niebuhr's mean rate. And of the $55\frac{1}{2}$, $20\frac{1}{4}$ occur between Lefke and Eski Shaher; $35\frac{1}{4}$ between the latter and Sakli: consequently Eski Shaher should be 45 G. miles from Lefke to the south-eastward. From Kutahiah, Eski Shaher is 12 hours of *ordinary* travelling by two reports: and by Paul Lucas, 11 of *quick* travelling: so that $27\frac{1}{2}$ G. miles may be allowed. The intersection of these distances places it N. 42 E. from Kutahiah: and *north-east* is the general estimation.

M. Tournefort reckoned 32 hours between Begbazar and Eski Shaher. The interval on the construction is $65\frac{1}{4}$ G. miles, giving a rate of only 2 and a very small fraction *per* hour; and we lose the opportunity of profiting by the *proportional* distance between Begbazar and Brusa, because the remainder of his time is given imperfectly.

The Antonine Itinerary has 141 MP. between *Dorylæum* (Eski Shaher) and *Ancyra* (Anguri); equal to $100\frac{3}{4}$ G. miles, which is the actual distance on the construction. And M. Niebuhr has 34 hours between Eski Shaher and Brusa; 74 G. miles; which agrees *very nearly* with his general rate, which would have given 76.

Between Eski Shaher and Sakli some interesting positions occur; as well belonging to ancient as to modern geography. First, is Seid-al-Gazi abovementioned, where the Smyrna and Anguri road crosses, at 9 hours from Eski Shaher. Next is Bardukly, the ancient *Docimæum*, with Grecian ruins

in that neighbourhood, and interspersed for many miles. Then Bayad, the *Beudos vetus* of Livy, 5 miles to the NW. of *Synnada.*

Bayad is situated at the crossing of the great caravan road between Karahissar and Anguri. Dr. Pococke travelled this road, but omits to mention Bayad, although others have mentioned it.

Bulawadin occurs between Bayad and Sakli. This is taken for the *Dinæ* of Manlius and Livy.

The ancient Roman road from *Nicæa* to *Laodicea Combusta,* &c. after passing Bardukly *(Docimæum)* strikes to the eastward of the modern road, leading through the site of *Synnada, Juliopolis,* &c.

SECTION XIX.

NORTHERN *Line through* ASIA MINOR, *through Amasia, Tokat, and Siwas, to Diyarbekir.*

THIS is the route to Bagdad and the East; the most frequented by European travellers: whence, more particulars respecting the ordinary circumstances regarding it are known, than on any of the others: at the same time that there is not even one observation of latitude to fix any point in it with the desired accuracy. Advantages, however, are derived from the numerous celestial observations of M. de Beauchamp, on the coast of the Euxine, by means of lines of distance, from no less than 6 points on that

coast; besides one from Anguri on the land side: so that, it is presumed, the parallels throughout the western half of it may not differ much from the truth.

There is, however, an incurable defect in this line. In the first place, being divided into two parts near the middle at Amasia, this central point is not so satisfactorily determined as could be desired; though by no means *absolutely defective* in point of *data.* And in the next place, the second half of the line between Amasia and Diyarbekir being formed of parts dissimilar in point of bearing, and of great diversity of surface, the *mean* rate of travelling, reduced to *direct* distance, could not be so well ascertained; nor the length of the parts be so well apportioned.

It happens fortunately, however, that we have one calculation of *time,* as well as of *distance,* made by *the same person throughout.* Hence, there is the best chance of the *proportional distance* being preserved; as the judgment of one person alone is concerned; and at the same time an unremitting attention to the quality of the ground, whether mountainous or level. The gentleman alluded to is the Right Honourable John Sullivan, who crossed Asia Minor, and Mesopotamia, in his return to India, in 1781. There are besides many other journals, from all of which some information has been drawn: but Mr. Sullivan's has been regarded, very justly, as the *master line.* In the next degree we place the journal of Mr. Vaughan.

The whole line between Nicomedia and Diyarbekir

may be divided into *three* parts :—1. To Amasia, eastward. 2. Amasia to Siwas, south, a little easterly. And 3, Siwas to Diyarbekir, south-east, easterly. The two grand intermediate points are thus placed: Amasia, from the intersection of 3 lines of distance from the coast of the Euxine; and Siwas, from proportioned distances from Diyarbekir (a point fixed by celestial observation), Kisariah, and Amasia.

The detail of placing Amasia is this: From Samsoun *(Amisus)* as Mr. Sullivan was told, it is 60 British miles, which may be taken *direct*, at 46 Geogr. The Abbe Sestini allows three caravan days' journey; say 49½. Mr. Hammer allows the same; but Dr. Howel, in his map, 38 only. We have allowed 48.

From Auniah, or Unieh, another place of observation on the same coast, 26 hours, or leagues, are reported. These hours may be taken at 2⅔, and the whole line of distance at 69⅓; or roundly at 70 G. miles. And, finally, Abulfeda, Otter, and Sestini, allow Amasia to be six journeys SE. from Sinub; ordinary journeys at 17½ give 105; but Abulfeda's at 19, 114 G. miles.

It has been a prevalent opinion amongst geographers, both ancient and modern, that the *Iris* river made a course to the eastward of north, from Amasia to the gulf of Samsoun. Ptolemy allows N. 20° E. (and 64 miles in distance). Dr. Howel allows NE. by N. in his map: M. D'Anville north exactly.

The intersection of the two shortest lines, that is, from Samsoun and Auniah, places Amasia S. ¾ W.

from the former: in which position it is about 104 from Sinope; and in lat. 40° 29′; long. 36° 1′.

There are no *cross lines* of distance whatsoever from the interior to check this position: on the contrary, the inland positions must depend on Amasia. It appears, however, probable that it is not misplaced 10 minutes in latitude or longitude. But in this case, it has happened that we have had *long lines* to act upon: and without those lines having been travelled over, and properly appreciated by any known traveller. The principal reliance ought to be, on the near agreement of three reports of the *distance* from Samsoun; and of the general opinion of its bearing southward from it: Samsoun being at the same time placed by M. de Beauchamp.

It will be proper, in the next place, to consider the distribution of the space on the long interval between Nicomedia and Amasia, which is 284½ G. miles, measured through the points of Boli, Keredy, Sherkesh, and Toosia; at each of which, a cross line of distance occurs to correct the parallel; whilst the longitude is regulated by the *proportional* distance obtained by means of Mr. Sullivan's computed miles; and hence, this part of the line is properly divided into five distinct positions [1].

The first, from Nicomedia to Boli merges in that of Mr. Browne, as far as Sabanja [2], and is 83 G. miles,

[1] The numbers and proportions will be found in their places, in the Map of Positions, No. X.

[2] Sabanja is checked by two lines of distance to the shore of the Black Sea; 10 hours NW. to Aghoa; and the same distance northward to Kirpa, or *Calpe*.

calculated on 109 British road miles, given by Mr. Sullivan, with proper allowances for inflexions, &c.

Boli *(Hadrianopolis)* is checked in its parallel, by two lines of distance from the Black Sea; the one from *Heraclea* of *Pontus*, 18 hours distant; the other to Bartin, 3 journeys; and thence to the mouth of the Bartin river *(Parthenius)* 5 leagues. There is also a line from the opposite quarter (SW.) of 28 hours from Eski Shaher.

The second portion is from Boli to Keredy, or Gheredy, 34 B. miles of Mr. Sullivan's, reduced to 25 G. miles direct. This place is said by Dr. Pococke to be 56 G. miles from Anguri, and 54 from Heraclea, (as before stated, page 260). It is, moreover, the *Carus* of the Antonine Itinerary, 80 MP. from *Ancyra;* equal to 57 G. miles, which is a near agreement with Dr. Pococke's report.

The third portion goes to Sherkesh, 44 British miles; reduced to 32½ G. miles direct. This place is 51½ hours, or 3 journeys of Dr. Pococke, a very little to the E. of north from Anguri.

The fourth is Toosia, 70 British miles, reduced to 54 direct. This place answers to *Pompeiopolis* of the Theodosian Tables.

This place is checked in parallel, both on the north and south-west. *Gangra*, or Kangiri, is one journey from it to the SW. by Abulfeda; and also 3 journeys in the same direction from Anguri; *i. e.* Toosia is 4 journeys from Anguri. The Theodosian Tables allow 35 MP. between *Pompeiopolis* and *Gangra*, equal to 25 G. miles; and Dr. Pococke 24. *Gangra* is also 131 MP. from Boli; 36 from

Anadynata, taken for Sherkesh; or two journeys ESE. by modern accounts. *Gangra,* or Kangiri, is therefore *placed* accordingly: and Toosia, both in respect of that and of Anguri; that is, 76 G. miles from the latter, answering to 4 days of Abulfeda.

From Ineboli, on the coast of the Black Sea, the check is perhaps more certain. Castemuni is 2 days SE. from Ineboli, 3 SW. from Sinub *(Sinope),* and Toosia is 3 days to the south of Castemuni [1].

Toosia thus corrected in parallel stands in 40° 41′, or 4 minutes to the southward of Nicomedia. Dr. Howel supposed, by his bearing, that Toosia might be about 9 minutes to the northward of Nicomedia.

The fifth and last portion terminates the line to Amasia. This is 116 B. miles of Mr. Sullivan's; reduced to 90 G. miles direct. Dr. Howel reckons this last portion to run E. 17 S.; as that from Nicomedia to Toosia, E. 3 N. If the two are taken together for the bearing of Amasia, from Nicomedia, it gives a difference of latitude of about 14 southerly, which deducted from 40° 45′, the latitude of Nicomedia leaves 40° 31′; and we have taken Amasia at 40° 29′. If this was really the result of the doctor's judgment, his talent in such matters must be pre-eminent. It may be added, that his time differed only 6 hours from Mr. Sullivan's (on the same line) on 129; and 16 miles on 389.

If the position of Toosia can be supposed to be

[1] The distance of two days SE. from Ineboli is collected from M. Peyssonel. His journeys may probably be taken as ordinary ones, at 17½ G. miles: but the others, from the Arabian geographers, at 19.

well checked, in point of latitude, from Ineboli; and of longitude from Anguri, this circumstance would give much confidence to the position of Amasia. For Mr. Sullivan gives a general idea of the bearing the whole way, so as to make Amasia bear E. 11½ S. or E. by S. from Toosia, with a difference of latitude of 18 minutes [1]. This gives the parallel of Amasia at 40° 23′, which is indeed 6 min. to the south of our assumed position from Samsoun; but must be regarded as an approximation, considering that the authorities are derived from different sources and opposite quarters.

The labour of research, and delay occasioned by repeated constructions of this line, and others depending on it, previous to obtaining the line of distance from Auniah, were greater than any other part of the work.

Tokat is the next position to be considered. From Amasia, as we have before observed, the line bends much more to the south to Tokat and Siwas. It is very unfortunate that none of the latitudes of these places should have been taken, since there is no line southward from Siwas to check its parallel. And the only check to Tokat is the six journeys from thence to Kisariah, reported by Tournefort. All that can be done, therefore, is to use the estimated distances from the three points of Amasia, Kisariah, and Diyarbekir, according to the rates previously

[1] Mr. Sullivan's *traverse* is as follows, between Toosia and Amasia:—

E. 14 miles; ESE. 11; E. ½ S. 26; E. 20½; and SE. 19. The whole E. 11½ S.

established. We are greatly indebted to Mr. Sullivan for the care employed by him in making the necessary remarks.

From Amasia to Tokat, the bearings reported in detail, by different persons, have been carefully examined and compared; and the result, founded on what appeared to be the best authorities, (for the road is very rough, and has a number of short turnings in it), is S. 34° E. The road distance, according to Mr. Sullivan, is 51 B. miles, for which 40 Geogr. *direct* are allowed.

M. Tournefort passed through this city, in his way from Erzerum to Anguri and Brusa; but the length and diversity of the way between Erzerum and Tokat precludes the application of his distances to the purposes of constructing the geography; otherwise than merely to arrange the intermediate positions [1]. Tavernier's line from Karahissar to Tokat is of considerable use; for it coincides very nearly with Mr. Browne's position of Mosul, or Moushiour, midway between Kisariah and Anguri. For, in 176 hours between Karahissar and Tokat, Moushiour, which is nearly midway, agreed within 3 hours.

It has already been stated that Tokat, in this position, is said to be six caravan journeys from Kisariah; but that the distance, on the construction, exceeds by about 6 miles. Tokat, thus placed, stands in lat. 39° 55′ 30″; long. 36° 29′.

Siwas is 66 B. miles from Tokat, by Mr. Sullivan, crossing the great ridge of Mount *Paryadres* by

[1] The time is given between the different intervals in No. X.

the way. We have allowed 50½ G. miles in direct distance. The bearing is reported to be much southwardly; but no statement is given, save in the map of Dr. Howel; where the whole line between Amasia and Siwas is given at S. 35 E. But the construction, which we proceed to detail, allows S. 18½ E. only.

The distance between Kisariah and Siwas is given by several modern reports; but the ancient ones are all corrupted.

Of the modern, Otter and Sestini report 4 days. Abulfeda 63 G. miles. Hajy Kalifa (from M. Hammer's MSS.) says 37 hours. M. Niebuhr gives 40 hours from Ullash, which may be reckoned 3 hours further from Kisariah than Siwas is; consequently, 37 is the number also.

Unquestionably, the two last reports are to be preferred, as being entirely independent of each other; and yet agreeing so well. For Hajy Kalifa's is inserted in his book of geography; and M. Niebuhr took his from the mouths of the caravan people. The former is a part of the road to Erzerum, so that it has the advantage of being reduced to a *proportional* scale; and there being 95 hours given from Kisariah to the baths of Elijah (near Erzerum) which space is 200 G. miles on the construction, the rate will be somewhat above 2·1 per hour; and 37 such, 77¾. It is proper to remark, that M. Niebuhr's caravan route between Diyarbekir and Siwas is much about the same, but rather lower; although in Asia Minor, generally, it is 2·22 to 2¼.

The four journeys of Otter and Sestini, if *ordinary*

ones of 17½ G. miles, fall considerably short of the 37 hours.

It may be proper to add, that Abulfeda allows 40 farsangs, equal to 127 G. miles, *direct*, between Siwas and Erzingan; and the space between the latter and Erzerum is taken at 35 hours; say 73 G. miles; total, 200. And 277 being the space between Kisariah and Erzerum, on the construction, 77 remain, of course, for the distance between Kisariah and Siwas.

On the whole, the reports of the 37 hours appear to be the best grounded on authority; so that 77 may reasonably be adopted.

The Antonine Itinerary has this road (*Cæsarea* to *Sebaste*) three times repeated, and all three different; and the Theodosian Tables different from all the others. They are 126, 134, 144, and 143 MP.; producing from 88 to 103 G. miles, whilst 116 MP. are fully equal to the highest of the modern reports.

Siwas, placed as above, stands in lat. 39° 5′; long. 36° 34′ 45″.

Let it now be enquired how this assumed position agrees with the space between Siwas and Diyarbekir, the termination of the present line; which will necessarily introduce the establishment of the positions of Meletyah, Kebban, Hesu Mansur, and Samisat, along the course of the Euphrates.

It is to be remarked, that the proper crossing places of the Euphrates, between Siwas and Diyarbekir, are Meletyah (ancient *Melitene*) and Tal Batrick; but that the decay of the Turkish power in this quarter has rendered that line of road

insecure, at least to Europeans; from whom our information is chiefly collected. And the great copper mine of *Maaden Kebban,* which is situated 12 hours above Meletyah, is, from the greater influence of the Turks at that place (and, it may be added, a great portion of courtesy on the part of the superintendant of the mine towards Europeans), become the ordinary place of transit over this famous river. In consequence, we are better informed respecting the Kebban road than the others.

The Kebban road leads out of that of Meletyah, to the left, or east-northerly from Hakim Khan, about 16 hours short of Kebban, and leads into it again at Karpoot, 10 hours to the SE. of Kebban. The mere loss of ground may not exceed 10 or 12 miles; but as the mines are situated *within Anti-Taurus,* a painful and dangerous journey of many hours is imposed on the traveller, which the other roads lead him clear of.

The *mean* of the different reports of time, employed between Siwas and Kebban, is 48 hours, through Hassan Chelebi and Hakim Khan. The country is here unusually rough, and the road circuitous, accordingly; so that little more than 2 G. miles per hour can be allowed on this line. Sestini allows, from the list of the public posts in Turkey, 43 hours between Siwas and Meletyah, the direct route; which would give about 88, at the same rate.

Still, however, the parallels of Kebban and Meletyah are wanting, and can only be supplied (as there is no one observation of latitude between Nicomedia and Diyarbekir, inland) from the side of Aleppo and

Aintab, through Samisat. But before this is gone into, it may be best to complete the line of distance to Diyarbekir.

The remaining part of this line is more difficult to approximate than the foregoing. The direction changes twice, between Diyarbekir and Kebban: that is, it lies in three different directions: first, NW., 14 or 15 hours, to the foot of Taurus; then, W. by N., to Karpoot, 20 hours, where the road divides to the NW. by N. 10 hours, to Kebban, and to W. by S. (or thereabouts) to Meletyah; said by Edrisi (p. 239,) to be two journeys, but doubtless overrated. The materials for the *different parts* of this road are various, and are from Hajy Kalifa, Edrisi, and certain European travellers.

Edrisi's consists of a line from Miafarakin to Kisariah; of which the only part applicable to the immediate purpose, is that between Argana and Karpoot [1].

Argana is a silver mine, reckoned next in value to Kebban, and lies within the SE. border of Taurus,

[1] This line originates at Miafarakin, 2 days to the ENE. of Diyarbekir, and passes through Argana (Ardis); at which place it is preferable to reckon from, as Miafarakin is a less certain position. Thence to Karpoot, 39 A. miles, and to Al Hamam (said to lie to the northward of Meletyah, 12 such miles,) 33 more. Total, 72 A. miles; equal to 76·22 Geogr. The extension of this line of $76\frac{1}{4}$ to a point, 12 A. miles to the northward of Meletyah, furnishes a presumptive proof of the general truth of that position. Finally, from Al Hamam to Kisariah (as understood to be intended) is 132 A. miles, or $139\frac{3}{4}$ Geogr., which agrees well, and seems to shew that Kisariah is the point intended. (Edrisi, p. 239.)

whilst the town of the same name (*Arsinia* of the T. Tables) is on the southern brow of the same ridge, at the distance of 14 or 15 hours from Diyarbekir, and universally allowed to bear NW. from it.

Edrisi allows 39 A. miles, 41¼ G. miles between Argana and Karpoot, and which agrees with the modern accounts; which are, Niebuhr, 20 hours; Sullivan, 19½; and Howel, 20½. The greatest part of this time is employed in crossing Mount Taurus, in a very oblique direction; therefore the rate must necessarily be low, and the 41¼ of Edrisi may well be taken. Karpoot is a fortress at some miles beyond Taurus, and, consequently, in the beautiful valley of *Sophene* (now Zof.)

Hajy Kalifa reckons 35 hours between Argana and Meletyah. It has appeared that 20 hours are taken up between Argana and Karpoot; so that 15 alone can remain for the distance between it and Meletyah; or, perhaps, 30 G. miles. Be it as it may, the 35 hours of Hajy Kalifa are very satisfactory, on this occasion, as they give, in one line, the whole distance between Argana and Meletyah; so that the result is much more simple than in the other mode. Accordingly, if Argana be taken at NW. nearly, distant 29 G. miles from Diyarbekir, and from thence Meletyah, 35 hours westerly, 70 miles, the traverse will give about 94 G. miles, as that from Siwas, by Sestini, at 43 hours, 88 miles. But this must partly depend on the parallel of Meletyah, which we shall proceed to enquire into.

Samisat[1] is the connecting point between Aleppo and Meletyah, and the parallel of the latter can be no other way obtained, than by tracing the distance through it. The difference of latitude is more than 2 degrees, and the bearing about NNE. and SSW.

Nor is the task of placing Samisat a very easy one: and this arises more from the discordancy, than from the want of authorities. Moreover, the information is derived more from ancient than from modern sources. And as Samisat has a particular reference to the positions of *Zeugma* and *Doliche;* the first, a celebrated pass (and bridge) over the Euphrates, between *Cyrrhestica* and *Osrohene*, &c.; the other, a principal station near Aintab; it becomes necessary, in the first place, to enquire into their situations.

Doliche appears, in the Antonine Itinerary, (page 190,) at 49 MP. from *Cyrrhus*, equal to 35 G. miles; (in the Tables, 48); but the distance between it and *Zeugma*, though given three different times, is always erroneous[2]. A place of the name of Dolouk completely answering in situation and description, lies 2 hours, or about 5 G. miles, due north from Aintab, which has been already placed, in page 4; and in this position it exceeds, by less than 2 miles

[1] Samisat, under the name of *Samosata*, was the capital of the ancient kingdom or province of *Comagena*, now Kamash. It is situated on the western bank of the Euphrates, below the several branches of *Taurus*, and at the bend where the river turns off to the SE., after pointing towards the gulf of *Issus*.

[2] It being severally 12, 14, and 24 MP., in pages 185, 189, and 191 of the Itinerary: 40 are required.

only, the distance given by the Itinerary. A party of English gentlemen visited it in 1702, and Mr. Drummond saw it from Aintab.

Zeugma, in the Theodosian Tables, is 64 MP. from *Hierapolis,* [northward,] or about 45¾ G. miles *direct*[1]. But as the road leads through *Ceciliana* and *Europus,* it is necessarily circuitous, as the former lies very far wide of the line, and the road afterwards conforms to the course of the Euphrates. (See Map, No. X.) Therefore, 43 miles is a very sufficient allowance; or the line of 45¾ may be laid off, through Ceciliana and Europus, and the result will place *Zeugma* at 9 G. miles *above* Beer, already placed by latitude and bearing, in p. 4, 8.

Accordingly, Zeugma falls exactly between Beer and Rumkala, both of which have been fixed on for its sites. Although the distance from Hierapolis is the only positive authority that we have for placing Zeugma; yet there are others that induce a strong belief of the general truth of the position. One is, that Dr. Pococke was informed, that a place of the name of *Zima,* with the ruins of a bridge near it, was 12 miles above Beer. (Vol. ii. p. 156.) Another, that M. Tavernier, in his route from Beer to Diyarbekir, by the *upper* road, travelling along the bank of the Euphrates, came to *Cechemé.* (Persian Travels, B. iii. c. 3.) No distance is given, but it is certain that the road does not coast the Euphrates for any great length of way. Again, M. D'Anville says

[1] Hierapolis, 24; Ceciliana, 16; Europus, 24; Zeugma: total 64 MP.

(Euph. et Tigris, p. 8,) "*Zeugma* n'est point trop altéré quant à presẽnt en disant *Zecme*." So that it appears he knew of it from other authority than that of Tavernier. M. D'Anville places it at Rumkala, which he supposed to be less than 8 G. miles above Beer, but it is at least 18; and the party, which descended by the Euphrates, in 1702, reckoned the distance, by the course of the river, 28 British miles [1].

Since Zeugma was the ordinary passage of the Euphrates, between *Cyrrhestica* and *Edessa*, as well as *Nisibis*, one would not look for it so high up the river as Rumkala, which is 17 or 18 miles to the northward of a line drawn from *Cyrrhus* to *Edessa*, and the country less favourable to a communication than at Zeugma. Moreover, one of the reasons for assigning it to Rumkala (the narrowness of the river) is done away, by the report of the travellers just mentioned, who found it narrower, in some places, between Rumkala and Beer, than at the former place.

In effect, Zeugma appears to have been placed at about 9 to 12 miles above Beer; the first being the result of the Theod. Tables, from Hierapolis; the second, the information collected by Pococke, and which agrees with the Cechemé of Tavernier, which appears to be the Zecme of D'Anville. The course of the Euphrates is there nearly south.

[1] It is reckoned a day's journey above Beer, and was found by Dr. Pococke to lie ENE. from Aintab, 12 leagues distant.

N.B. The Journal of the Travellers, in 1702, was communicated by Mr. Claud Russell, brother to Dr. Patrick Russell.

Having established the positions of *Zeugma* and *Doliche*, the space between them, which is $28\frac{1}{4}$ G. miles, nearly in the parallel, becomes a *base* for the position of Samisat; to which there are lines of distance, from both places, in the Tables.

That from Doliche is 41 MP., and from Zeugma, 51; answering respectively to $29\frac{1}{3}$ and $36\frac{1}{2}$ G. miles, and which intersect in lat. 37° 39′ 30″, and in a bearing of about N. 38° W. from Zeugma.

Ptolemy gives its latitude at 37° 38′, and describes a north-westerly bearing from Zeugma; so does Edrisi. Its latitude, in the Oriental Tables, varies from 37° 30′ to 45′; amongst which, Abulfeda has 37° 30′; but it has been observed that Abulfeda's latitudes in Syria are generally too much southerly; even as much as 20 minutes in some places.

The longitude of Samisat, in Nasereddin and Ulegbeg, is 25 minutes to the east of Aleppo, and by the Ayin Akbaree, 15 west of Membedge, or Hierapolis. In effect, the latitudes, ancient and modern, differ amongst themselves only 15 minutes, and the longitudes, 12; and the position given by the distances from *Doliche* and *Zeugma* is nearly a mean of all the different authorities. It is accordingly placed in lat. 37° 39′ (neglecting the fraction), and in long. 37° 41′. We regard this result as being very satisfactory; but it is certain that Edrisi's distances to it, from Orfah and Jiallab, do not agree. But, at the same time, these two reports contradict each other; for Orfah and Jiallab are, as nearly as possible, equidistant from Samisat; but Edrisi gives

69 A. miles for the one; 54, for the other. A mean of the two, applied to either place, would nearly agree. It appears to be perfectly in harmony with the positions on the west [1].

As a geographical point in the construction, Samisat is of very great importance, as it regulates the position in north Syria; as well as that of the chains of *Taurus* and *Amanus*, which shuts up the countries of *Comagena* and *Mesopotamia*, on the N. and NW.; and without it, the parallel of Meletyah must have remained in the utmost degree of uncertainty.

The distance between Samisat and Meletyah (*Melitene*) is given, both in the ancient and modern authors, in a very circuitous way. Thus, the Theod. Tables conduct us along the side of the Euphrates, which, in this part, forms an unusually deep bend, so as to increase the distance by about *four-fifths*. And the Antonine Itinerary carries the road through *Perre*, a pass on the Syrian side of *Taurus*, 24 MP. to the NW. of *Samosata*, (that is, at *right angles* with the line of the road to Meletyah); so that the only use of the two portions of this road is to fix the position of *Perre* itself.

Edrisi places Hesu Mansur at 21 A. miles from Samisat, on the road to Meletyah, or 22¼ G. miles.

[1] Marash is 13 farsangs from Samisat, through Zabothra, taken for the Rumkala of Mr. Vaughan, and therefore not far out of the line between the two. *Germanicia*, taken for Marash, is 58 MP. from *Samosata*, in the Tables, or 41½ G. miles, which agrees very nearly to Marash. And Marash is 4 journeys to the east-northerly, from Adana. (Ibn Haukel.) These may be taken at 76 G. miles, and the construction has 74.

This fortress is known to be near the western bank of the Euphrates, whose course, in that part, is from the north-eastward, or taken at E. 30° N. From thence to Meletyah, by the same authority, is 30 A. miles, or 31¾ G. miles; the course, certainly northward. These lines, reduced into *one* of 49 miles, and laid off to meet that from Diyarbekir, of 93¾, or 94, the intersection will place Meletyah in lat. 38° 22′ 20″; long. 38° 10′; in which position it will stand at 86½, instead of the 88 of Sestini, from Siwas.

By this result, it appears that Meletyah lies but a very few miles out of the direct line, between Siwas and Diyarbekir; since the whole distance, on a straight line, is scarcely two miles more than the sum of the two parts; the one being 178½ G. miles; the other, little more than 180. No *exactness*, however, can be pretended to, either in the calculation of this distance, or in the parallel of Meletyah. Enough has appeared, in the course of the investigation, to shew that the roughness and crookedness of the road are unfavourable to the attainment of the former; and, in respect of the latter, the distance from the nearest *corrected parallel* (for that of Aintab is deduced from the observation near Beer) is too great, and the authorities derived from books only. No better, however, were attainable; and it is doubtless very unfortunate that there should not be one observation for the latitude, between Adana and Sinope, or between Beer and Trebizonde; the first interval 5 degrees; the second, 4.

It remains that Kebban should also be adjusted,

on the same ground as Meletyah. This, of course, is easily done; for as the known distance between the two is 12 hours, or 26 G. miles: whilst Karpoot is 10 hours from Kebban; taken at 22 G. miles; and 30 from Meletyah; the triangle is complete: and Kebban will take the parallel of 38° 42′, or 19½ min. to the north of Meletyah. And it will be distant from Siwas 95; and from Diyarbekir 85½ G. miles. The rate between Siwas and Kebban is, therefore, less than 2 miles *per* hour: but the road is *very circuitous,* as well as rough.

SECTION XX.

Mr. Browne's Line from Smyrna to Oulubad, near Brusa: with an extension of the Line to Akhissar, Sardis, and Ephesus.

Mr. Browne carefully registered his compass bearings and time, all the way from Smyrna to Brusa and Constantinople; taking observations of latitude as often as he could. Between Oulubad and Constantinople these have been already noticed: the present subject extends from Oulubad to Smyrna.

The general result of this line of bearing between Smyrna and Oulubad, cleared of variation (13½ deg.) was N. 25° E.; but the construction requires N. 31° 40′ E., or 6° 40′ more easterly: but even this approximation proves much zeal, judgment, and

attention; and reminds us of Mr. Carmichael's line on the Great Desert, which differed no more than about 6 or 7 degrees, on a distance of 700 miles [1]. His number of hours was $50\frac{3}{4}$, and the distance, $121\frac{1}{4}$ G. miles, gives a rate of 2·388 G. miles *per* hour. These are applied accordingly: and besides a number of inferior positions, the following are established, which serve as points of outset, for other lines and positions.

1. *Magnesia* at Mount *Sipylus*, now Manessa. Here the latitude was taken, 38° 41′ 30″; besides which, the position of the high part of Mount Sipylus is fixed; and serves as an object to fix the bearing and parallel of Sardis, Mr. W. Hamilton having *set* it from the tomb of Alyattes.

2. Jelembe: from which, and from Magnesia, two lines of distance fix Akhissar, or *Thyatira*.

3. Balikesr: lat. by observation 39° 22′, from whence Eidermit, or *Adramyttium*, is said to be 18 hours (ordinary travelling) to the west.

4. Demir-Kapi, a fortified pass in Mount *Temnus* Here the latitude was also taken, 39° 49′. This appears to be the mountain seen by Mr. Hawkins from Olympus; bearing W. 18° 20′ S.

5. Susugherlek: from whence M. Chishul's line to *Lampsacus* originates.

Oulubad, the termination of this line has been

c

[1] Some later observations place Smyrna so far east as 27° 13′; whereas, we adopted 27° 7′, previously. If Smyrna *be* more to the east, the more exact will Mr. Browne's original bearing have been.

already spoken of in Article XIV. Its latitude, by Mr. Browne's observation, 40° 9′ 30″.

Akhissar, by the mean of different authorities, stands at 10¼ hours to the NE. of Magnesia; 7½ S. a little E. from Jelembe. It is also 36 MP. from Magnesia, in the Theod. Tables; answering to 25·7 G. miles. By inscriptions at this place, published in M. Chishul's Travels, this is unquestionably the ancient and noted city of *Thyatira.*

Sardis, (now Sart) lies to the SE. of Akhissar, 10½ hours; taken at 24 G. miles. The Antonine Itinerary has 33 MP.; and the Theod. Tables 36; respectively; 23½ and 25¾ G. miles: the mean 24½.

Sardis is, moreover, 18 hours to the E. by N. of Smyrna; for which 41 G. miles are allowed. It is also 14 hours from Magnesia, through Cassaba, or Durguthli, a place in the road common both to Magnesia and Smyrna; 8 hours from the former, 12 from the latter: and itself 6 from Sardis.

The intersection of the lines of distance from Smyrna and Akhissar; that is, 41 and 24 G. miles, respectively, places Sardis in the parallel, to which we should have assigned it, from the bearing of Mount *Sipylus,* taken from the monument of Alyattes. That parallel is 38° 34′; the monument is at 4·6 G. miles N. 2° W. from Sardis: and the bearing of the highest part of Sipylus from thence, cleared of variation, was W. 8° 45′ N., taken by Mr. W. Hamilton. That high point itself bears from Magnesia ESE. ½ S. 2¾ G. miles.

As a great variety of materials offered for the dis-

tance of Sardis from Smyrna; and for the space between Sardis, Ephesus, and Magnesia, inclusive; great pains were taken to compare and to select them [1].

Ephesus and Aiasaluk. By the former is intended the ruins, now universally admitted to belong to ancient Ephesus; the other, the modern town and castle often mistaken for Ephesus; but, in reality, situated full 2 miles higher up the course of the *Cayster* river, or Little Meinder. (See No. XII. letter G.)

Since no charts published from authority, have yet appeared, of this coast, it was not an easy task to fix the positions of these places. A chart, generally referred to the Marquis de Chabert, gives a bearing of S. 26° E., between Smyrna and Aiasaluk. The latitude of this latter is said to be 38° within a very small fraction: the distance between them 13 hours, given almost universally: but then it is very circuitous; for it *coasts Mount Gallesus;* which must increase the time an hour and a half.

Strabo allows 320 stadia to Ephesus; and it is understood, that there was a Roman road, or causeway, the whole way; and as straight as possible: but it appears to have bordered on insanity, had they carried it over so lofty and steep a mountain as that

[1] Smyrna to *Sardis*, or Sart.

	Hours.	
Niebuhr	18	
—— second account	$18\frac{1}{2}$	
Uskoe	18	Mean 17.9; or say 18.
—— second account	17	
Seetzen	18	

of *Gallesus* (Alyman): besides, *Metropolis*, which is said to have been on that road, lies far out of the line; and but just wide of the present road.

Taking the 320 stades for Roman, (as we probably should in this place), they are equal to 32 G. miles, (600 stades to a degree); and the direct distance between the two places appears to be 30 such miles. It would appear, therefore, if the parallel of Aiasaluk be 38°, or 27′ only south of Smyrna, that 26 degrees is too great an obliquity: and we have taken the bearing, accordingly, at S. 22 E. For Ephesus is somewhat farther from Smyrna than Aiasaluk is.

The reader will find in the Map, No. XII. letter G. the detail of the lines between Smyrna and Ephesus; with the Valley of the *Cayster*, *Mount Gallesus*, &c. on an enlarged scale.

Between Aiasaluk and *Sardis* are reckoned 20½ hours; and, as much time is lost in crossing *Mount Tmolus*, little more than caravan rate can be allowed, on the whole; or 45 to 46 G. miles, direct. The town of Tireh is on this road, 8½ hours from Aiasaluk; through which passes the great road from Smyrna to Guzelhissar and Castra Marmora.

The Theod. Tables give the route between *Ephesus* and Sardis 63 MP. taken at 45 G. miles, direct. The road, to the southern foot of *Tmolus*, lay through the *Caystrian* Plain [1].

[1] Herodotus (Terp. c. 54.) allows no more than 540 stades between Ephesus and Sardis; which, at the rate of the Itinerary stade, would give about 45 G. miles only; or on Strabo's scale 46¼. This is somewhat less than the *direct* distance between Ephesus and Sardis.

The coasts and islands of the whole gulf of Smyrna, together with the whole canal of Scio, the mouths of the *Hermus, Clazomene,* &c. were accurately surveyed by Mr. Wilson, Master of his Majesty's ship Zealous, in about 1801. But the opposite side of the peninsula, and isthmus, of *Erythræ* and *Clazomene* are taken from other charts. The Journal of Dr. Seetzen, by land, which allows 17¾ hours from Smyrna to Chismé, opposite to Scio, agrees well with Mr. Wilson's survey. Vourla, the *modern* Clazomene, is 9 hours from Smyrna; and from Vourla to Ephesus is reckoned 18 hours, along the indented coast; so that all these positions appear to be in harmony with each other.

SECTION XXI.

Line from SMYRNA, SARDIS, *and* EPHESUS, *to* KUNIYAH, *or* ICONIUM.

SARDIS and Ephesus have both been placed, in the last article: and we shall first take the road from Sardis to Degnizlu, south-eastward; at which place, the road from Ephesus, eastward, joins the common road to *Iconium.*

Allashahr (formerly *Philadelphia),* is the first place of note; and according to Dr. Chandler, lies ESE. 10 hours from Sardis. For these, consulting the circumstances of his situation, and mode of tra-

velling, 24 G. miles are allowed. The Antonine Itinerary has 28 MP., equal to 20 G. miles. Thence to Degnislu, by M. Niebuhr, (for Dr. Chandler did not go direct,) 16 hours, or $35\frac{1}{4}$ G. miles, SE. by E.; as collected from Chandler. The *Mæander*, or Great Meinder[1], is crossed, a few hours short of Degnislu. The whole distance, in a direct line from Sardis, is taken at $58\frac{3}{4}$ G. miles to Degnislu.

The ancient city of *Hierapolis* of *Phrygia*, or at least, its remains, are about 8 miles N. 25 E. from Degnislu; and between the two, is the naked site of *Laodicea ad Lycum*. The Antonine Itinerary has 73, the Tables 76, MP., between *Sardis* and *Hierapolis;* the highest account being equal to $54\frac{1}{4}$; but the construction has 58. It may be, that too much has been allowed for the inflexions, on the Roman road; as a part passes through the *Camp of Cyrus*, an extensive plain, on the E. and SE. of Sardis[2].

We shall now examine the line of the road from Ephesus, or Aïasaluk, to Degnislu.

At the village of Kelsikui, 6 hours from Aiasaluk, and 2 miles to the northward of Inebazar (a village adjacent to the ancient city of *Magnesia*, at the *Mæander)*, Mr. W. Hamilton found that his station was in the direction of E. 9° S. from Aiasaluk. Strabo states the distance between *Ephesus* and

[1] The Cayster is called the *Little* Meinder.

[2] It is obvious, that a canon for the reducing of *road* distance into *direct* distance, calculated on the *general mean* of *winding*, cannot agree with all situations; but must give results that are occasionally over or under.

Magnesia to be 120 stades; and thence to *Tralles*, 140; total 260. *Tralles*, therefore, must have been at Guzelhissar, generally taken for Magnesia, till Mr. Hamilton set the public right. He found Guzelhissar to be 5 hours from Inebazar (Magnesia is to the *westward* of the latter) and to bear E. $8\frac{1}{2}^{0}$ S. from it. Consequently, Mr. Hamilton's estimation of his distance from Aiasaluk to Guzelhissar would be 11 hours, besides the small addition made by the obliquity of the position of Kelsikui; which might be a mile, or less. Accordingly, $24\frac{1}{2}$ G. miles may be taken, on a general bearing of E. 13° S. from Aiasaluk.

Strabo's 260 stadia from *Ephesus* to *Tralles* (taken for Roman) are equal to 26 G. miles, and agree very well. (See again XII. G.)

There are some cross lines of distance, between Guzelhissar and the Smyrna and Sardis roads, that are proper to be noted; as corroborating the general statement. Their bearing on the subject will be best understood by a reference to the maps of position, No. X. and XII. letter G.: but one, in particular, is pointed out here: between Kelsikui and Cassaba, which latter bears W. 7° N. from Sardis, the distance by Mr. Hamilton is 16 hours, through Bainder, which stands exactly midway; and is itself 11 from Sardis. This will shew that the space between the *Sardis* and the *Magnesian* roads is not ill arranged.

Between Guzelhissar and Degnislu, the line of distance and bearing is almost entirely collected from Dr. Chandler. The general bearing is about

$\frac{3}{4}$ of a point to the north of east (the particulars of which are given in a note [1]); and the time $23\frac{3}{4}$, or say, 24 hours: the rate taken at $2\frac{1}{3}$ G. miles, whence the result is $55\frac{1}{2}$ G. miles, taken strictly.

Thus the two lines of distance from Sardis and from Guzelhissar, the former of $58\frac{3}{4}$, and the latter of $55\frac{1}{2}$ G. miles, place Degnislu in lat. 38° 1′; that is, almost due east from Aiasaluk. But it is to be regretted, that there are no means of checking this parallel, by any direct lines from the north or south: for it must be readily admitted, that the bearings beyond Allashaher on the one hand, and Guzelhissar on the other, cannot be implicitly relied on, (not being taken by such practised men as Messrs. Browne and Carmichael); but this is in their favour, that they were both taken by the same person, Dr. Chandler. (See No. X.)

The only circumstance like a check is Dr. Pococke's bearing of *Hierapolis*, from Aufium Karahissar. *Hierapolis* is 8 G. miles to the NNE. of Degnislu; and its bearing from the former is given by the Doctor at W. 28° S.; and the construction has W. 29° S., from the combination of the authorities already detailed.

Had Degnislu (which, Dr. Chandler justly con-

[1]

		Hours.	
Guzel-hissar to Sultan-hissar	Eastwardly . .	5	
Eski-hissar *(Nysa)* . . .	North-eastwardly	1	
Nosli	East-northwardly	5	$24\frac{3}{4}$
Ferry, (near *Carura)* . .	ditto . . .	7	
Degnislu	ditto . . .	$5\frac{3}{4}$	
Eski-hissar *(Laodicea)* . .	NNE.	1	

cludes, has succeeded *Laodicea*, in that quarter of the country,) stood in an open level country, something might have been collected respecting its situation, from the course of some principal road; as from Ephesus to *Celænæ*, or *Apamia-Cibotus:* but it stands, on the contrary, at the mouth of a kind of pass, formed by the course of the Mæander, between the ridges of *Tmolus* and *Cadmus;* which necessarily compels the union of all the roads from the eastern quarter, at that point.

It is proper to state, that *Laodicea* stands at 1 hour to the NNE. of Degnislu, and that it is also 6 MP. from *Hierapolis*, in the Antonine Itinerary: and which is, indeed, the utmost extent of the Itinerary, that way. *Carura*, a pass over the *Mæander*, was 20 MP. to the westward (i. e. *below) Laodicea*, in the Theod. Tables; and to that place Strabo has a line of distance from Ephesus; and thence eastward to *Tomisa*, on the Euphrates; which will be spoken of when the subject of the Roman roads is treated of.

From Degnislu, eastward to Kuniyah *(Iconium)*, the road runs generally in a single line, through Isbarteh *(Baris)*, which properly divides it into two portions; being itself corrected in parallel, by a line of distance from Aufium Karahissar, which lies to the northward of it.

M. Niebuhr gives 70 hours for the length of the whole line, from Degnislu to Kuniyah; of which 27 are between the latter and Isbarteh, 43 between Isbarteh and Kuniyah. Lucas travelled over the latter portion, only; and he reckoned 44¼, coming closely to M. Niebuhr's report. Lucas came into

the first portion of the road at Burdoor, 6 hours short of Isbarteh: and to the former place, from Allashaher, reckoned 40 hours; which is 37 of Niebuhr's: so that there is a general agreement between them.

The space on the construction between Degnislu and Kuniyah is 160½ G. miles; giving a rate of nearly 2·3 *per* hour. Lucas's proportion would have been about 2·22, at the rate between Isbarteh and Kuniyah. (See again No. X.)

According to M. Niebuhr, Isbarteh is 23 hours to the southward of Karahissar, by the *direct* road, (for there is a second road of 25, by Getchi Borlee.) Taking these at 52 G. miles, Isbarteh takes the parallel of 37° 54′ 30″, when placed at the proportion of 27 hours from Degnislu; 43 from Kuniyah. In this position it is only 4½ miles to the southward of a direct line drawn between Degnislu and Iconium.

General Koehler travelled from Burdoor to Kutahiah, through Sandukly, (taken for the *Celænæ* of Xenophon). His time gave a rate of 2·05 G. miles only. The other line is to be preferred, both because it is shorter, and also from a caravan route [1]. The route itself, however, is of considerable importance, as giving more certainty to the position of Sandukly; and also of placing an additional point, in the course of the river Mæander: since the proportional parts are equally useful, whether the rate be quick or slow, when the extremities of the line are fixed.

[1] The General's mode of travelling is not known to the author.

Sandukly was 18 of General Koehler's hours to the N. of Burdoor; 25 S. of Kutahiah. Dr. Pococke, who went from Sandukly to Karahissar, reckoned the bearing NE., and the distance a day and a quarter. And accordingly, the General's line confirms this statement in every respect.

It should be mentioned, that *Colossæ*, now *Konos*, is situated at 5 hours to the ENE. of Degnislu; and a little to the north of the road to Kuniyah.

SECTION XXII.

Connection of BRUSA *with the* DARDANELLES, PERGAMUS, *and* SMYRNA.

FROM Susugherlik, a stage short of Oulubad in Mr. Browne's line, (see p. 287,) the Rev. Mr. Chishul gives a line of distance, north-westward to *Lampsacus;* and the Rev. Mr. Uskoe gives another, to the same place, from Oulubad and Mahalitch, falling into the former at the bridge of Koker-jinlik, (over the *Esepus.)*

Mr. Chishul's rate was rather high; travelling in company with a few Turkish horsemen only. He reckons 28 hours from Susugherlik to the sea-coast (of the *Hellespont),* 4 hours short of Shardak, the present crossing place to Gallipoli; and which is itself an hour and a half short of *Lampsacus.*

At 14 hours, that is, midway, he came to the bridge of Koker-jinlik, over the Sataldere river, *(Esepus)*; in 8 more, to that over the Oostvola *(Granicus)*; and in 6 more, to the sea-coast, at Koridji: and from thence, he rode on the strand 4 more, to Shardak. Between Smyrna, Ephesus, Sardis, &c., as well as in his whole journey from Smyrna to Adrianople, his rate is always very high. And in the present case, as it is 70 G. miles from Susugherlik to Koridji, the rate must be no less than $2\frac{1}{2}$ G. miles *per* hour [1]. Both of the extremities of the line are well determined: Lampsacus by celestial observation, Susugherlik by Mr. Browne's line. As Shardak is $11\frac{1}{4}$ miles from Koridji, and the time 4 hours, the rate is still higher. Lampsacus is 3 miles beyond it; or $14\frac{1}{4}$ in M. Kauffer's Map of the Propontis and Hellespont.

Mr. Uskoe's report has $35\frac{3}{4}$ hours between Mahalitch and Shardak; of which $18\frac{1}{4}$ are to the bridge of the Sataldere (the Koker-jinlik); $13\frac{1}{4}$ more to Koridji. This line, taken through the place of the bridge, in $73\frac{1}{4}$ G. miles, or $3\frac{1}{4}$ more than M. Chishul's from Susugherlik: and hence the rate is rather above 2·3.

If we take $18\frac{1}{4}$ hours, at this rate, we have $42\frac{1}{2}$ G. miles, for the distance of the bridge from Mahalitch. On the other hand, for the 14 hours of Mr. Chishul, from Susugherlik, at $2\frac{1}{2}$, we have 35. The bridge is 7 to 8 miles from the river mouth, (or rather from the sea, opposite to the bridge), on which

[1] But still within the rate of horsemen, which extends to $2\frac{2}{3}$.

parallel the distance from Mahalitch falls at 4 miles beyond that from Susugherlik. If we suppose that the distance commenced at Oulubad, instead of Mahalitch, the distance between those towns, near 3 miles, would nearly settle the difference. We have placed the bridge at 40 from Mahalitch, 36 from Susugherlik, as a compromise.

Much information arises out of this line of Mr. Chishul's. He was versed in ancient history; and, therefore, remarked many circumstances that others would have overlooked. He crossed a river to the west of Susugherlik, named Mulotele, which may be that of the *Miletopolis* river modernized. He noticed the lake Biga; doubtless that heretofore named *Aphnitis;* and the Tarza river that runs through it; unquestionably the *Tarsias* of Strabo. Also the Peninsula of Cyzicus, whose western flank was fully open to view before he descended into the plain; which he justly takes for the *Adrastrean.* The Oostvola he crossed also, over a bridge, at 3 hours distant from its mouth; and this is the *Granicus.*

Thus the modern authorities agree well with the space between Brusa and the first place fixed by celestial observation westwards; that, is *Lampsacus*[1]. And this is, indeed, very remarkable: for it may be recollected, that Brusa is determined by the bearing of Olympus from Constantinople: that Oulubad

[1] Not only Lampsacus, but Gallipoli has its latitude and longitude from celestial observations. Those of Lampsacus are, lat. 40° 21′, long. 26° 36′. And of Gallipoli, lat. 40° 25′ 30″, long. 26° 37′.

rests on an estimated distance from Brusa; and Susugherlik, from whence Mr. Chishul's line is laid off, by Mr. Browne's line from Oulubad. Yet, in despite of these three separate operations, there is no reason to be dissatisfied with the result.

The Antonine Itinerary is silent in this part: the Theodosian Tables utterly corrupted. Strabo has a line of 700 stadia from the *Esepus* to *Abydus;* but one hardly knows how to apply it.

The next and last place, westward, that has its longitude from celestial observation, is the Asian Castle of the Dardanelles, near the site of *Abydus.* Its lat. is 40° 9′; long. 26° 19′; so that it is only about 18 G. miles to the SW. of Lampsacus. Kauffer's map has upwards of 19. The Antonine Itinerary and Theodosian Tables have 24 MP.; answering to 17¼ G. miles to *Abydus,* which may be about a mile short of the castle. Strabo has 170 stadia. Thus we have completed the line from Brusa to the Dardanelles.

Connection of the Dardanelles with the Troad, Adramyttium, Pergamus, and Smyrna.

As the map of M. Kauffer has been made use of for the coasts of the sea of Marmora, generally; so, between the Castles and the Troad, it is adopted as the only authority. Accordingly, the bearing between the Asian Castle and Koum-kala, near the ancient promontory of *Sigæum,* is taken from him,

at S. 40° W. and the latitude at 40° 2 20″.; so that the distance adopted is 10½ G. miles, as in Kauffer.

Captain Hayes reckons 6 hours between the Asian Castle and Koum-kala; but the coast forming so deep a recess, it is difficult to apply the distance.

From Koum-kala (in effect, *Sigæum*), the NW. extremity of the Troad, the map of M. Kauffer, published by Messrs. Cripps and Clarke, from Count Ludolf, has been followed, with the exception of an extension of the scale in the south-eastern part: that is, Mount *Ida* was supposed to be too near to Koum-kala, and to Cape Baba *(Lectum)*. In consequence, the angles taken by Mr. Hawkins were preferred to those taken by Kauffer, whilst the same base was adopted: namely, the distance between the two barrows generally known by the names of Achilles and Æsyetes. Hence, the distance of the summit of Ida from the latter is taken at 30·63 G. miles, instead of 26·51; and it is placed from Koum-kala E. 33 S. 34 G. miles: lat. 39° 43′ 50″. In effect, the summit of Ida is removed 4 miles to the south-eastward; and the southern coast of the Troad extended proportionably.

The numbers of miles in the Antonine Itinerary, and Theodosian Tables, agree very well with this map, extended over it in particular directions. The former allows 37 MP. between *Abydus* and *Alexandria Troas;* equal to 26·4 G. miles; and the construction has 25½; and from the same Alexandria to *Adramyttium,* through the site of *Antan-*

dros, 56 MP. equal to 40 G. miles, which agrees within a fraction [1].

The distances given by Dr. Pococke, and Professor Carlyle, agree best to the corrected position of Mount Ida. From the Silver Mine, near Skupchu, the former reckoned 6 hours, eastward, to Bairamieh, which is 14·1 G. miles on the construction. And thence to Evjelar, Carlyle gives $3\frac{1}{2}$ hours, which is $6\frac{1}{2}$ miles on the construction. The next 5 hours, south-eastward, were chiefly spent in the ascent of the base of Mount Ida; and may not be reckoned more than 6 G. miles direct. The mine is about $25\frac{1}{2}$ such miles from the summit of Ida.

We have the following modern routes across the Troad.

Captain Hayes reckoned 14 hours between Koumkala and Muhzurady on the southern coast of the Troad; $29\frac{1}{2}$ G. miles on the construction; or 2·1 per hour; the country very mountainous. And from thence to *Adramyttium*, 10 hours; $20\frac{3}{4}$ G. miles on the map; rate, 2·075.

Mr. W. Hamilton reckoned from the northern corner of the gulf of Adramyttium to Bairam Kalasi (or *Assos*), $10\frac{3}{4}$ hours [2]. The construction has $25\frac{1}{4}$

[1] The reader should be informed that the Itinerary and the Tables differ in respect of the distance between *Antandros* and *Adramyttium*: the former having 21 MP.; the latter 16. The former is adopted.

[2] Mr. Hamilton from the citadel of *Assos*, Bairam-kalasi, took the following bearings: Mount *Ida, (Gargarus)*, E. 19° N.; north point of Lesbos, W. $13\frac{1}{2}$ S.; Castle of Motoba, S. 31° 30′ W.; east point of Lesbos, S. 19 E.; mouth of a river, N. $31\frac{1}{2}$ E.; Mantesha, N. $30\frac{1}{2}$ E.; Pashakoi, N. $13\frac{1}{2}$ E. (clear of var.)

G. miles, or 2·35 per hour. This seems also to be in favour of the corrected position of Ida.

The Turkish geography of Abu Bekir allows 18 hours between Eidermit, (or *Adramyttium)* and Balikesr; which space on the map measures 47½ G. miles only; requiring a rate of 2·64 per hour. *Tatars* certainly go at this high rate; but it is not an *ordinary* one in Asia Minor, although it be in Rûmili. At the same time, the rate of Professor Carlyle, from Constantinople to Iconium, was no less than 2·6; and this was also Mr. Bell's rate in Rûmili; the whole way from Constantinople to the Danube. But it has appeared to the author, that the rate of travelling on the European side of the *Propontis* is greater than on the Asiatic side: possibly owing to the difference in the breed of horses [1].

Pergamus and Smyrna.

We are chiefly indebted to Mr. William Hamilton for these materials.

From Kiomer, or Keemer, a town at the south side of the gulf of Adramyttium, the summit of Ida, (Gargarus) bore N. 13½° W.; (true) according to Mr. Hamilton, distant about 10½ G. miles: and Adramyttium itself NE. distant 2 hours, according to Captain Hayes. It appears that the intermediate

[1] It is possible that the Professor's journey was made under particular circumstances.

tract has formerly constituted a part of the gulf; and we suspect, from the words of Captain Hayes, that it was *covered* at the time he passed; for he went round in 4 hours; whereas Mr. Hamilton, at a different time, crossed from Kiomer in $1\frac{3}{4}$. This, probably, depends on the wind.

Pergamus, now Bergamo, lies equally in the road to Smyrna, or Sardis; and it may be remarked, that all the Roman roads in the west of Asia Minor centered in Pergamus. It stands, according to Mr. Hamilton, 10 hours to the SSE. or more easterly, from Kiomer; and the mean of the different reports places it about E. 30° N. from Yalea *(Elæa)* on the sea-coast; distant 5 hours. And from Pergamus to Akhissar, Mr. Hamilton reckoned 15 hours; that is, 25 between Kiomer and Akhissar. The intermediate space, taken *through* the point assumed for Pergamus, at 5 hours inland from Yalea, is 60 G. miles; giving a rate of 2·4 per hour. It appears a matter of uncertainty, whether Pergamus occupies its proper position in respect of longitude; for though its distance from Yalea on the sea-coast may be right, yet there is no certainty that the coast itself is right; for we could obtain nothing better than M. D'Anville's coast of the Archipelago. On the construction, it stands in latitude 39° 12′; and in M. D'Anville's, 39° 10′.

Mr. Hamilton estimated the bearing between Pergamus and Kiomer NW. by N.; and between Pergamus and Akhissar SE.

Captain Hayes was $12\frac{1}{4}$ hours from Kiomer to

Pergamus; and from thence to Menimen, 12 hours: total 24¼. Menimen is placed, on the authority of Mr. James Morier, at 11 G. miles north-westerly from Smyrna; and the whole space between this latter and Pergamus being 44 miles[1], of course 33 remain for the space between Menimen and Pergamus; requiring a rate of 2¾.

Hence it is possible, that Pergamus is more to the south than we have placed it; but the Journal of Captain Hayes was not before us till after the construction was completed.

If the 24¼ hours of Captain Hayes, between Kiomer and Menimen *be taken together;* and 57½ G. miles allowed for the space between them, the rate will be 2·37[2], or under 2·4; much the same as Mr. Hamilton's, the whole way from Akhissar to Kiomer. With this new rate, if we calculate Captain Hayes's 12¼ hours, they give 29 G. miles, for the distance of Pergamus from Kiomer, which is 5 more than Mr. Hamilton's; and so much nearer, by this account, Pergamus should approach to Smyrna.

It is to be observed, however, that M. D'Anville allows no more space than 22½ G. miles between Kiomer and Pergamus; and M. de Choiseul no more than 20.

[1] M. D'Anville allows 45.

[2] Captain Hayes's rate:—

	G. M.	
Rodosto to Gallipoli, 20 hours . .	50	= 2·5
Koumkala to Muhzurady, 14 hours	29½	= 2·1
Thence to Adramyttium, 10 hours .	20¾	= 2·1
Mean		2·23

Elæa, now Yalea, is 45 MP. from *Adramyttium*, in the Theodosian Tables, equal to $32\frac{1}{4}$ G. miles: then it follows the *bend* of the coast; and may not be more than 28 or 29 *direct*. Pergamus is universally understood to bear to the north of east, considerably, from *Elæa;* which was nearly at the mouth of the *Caicus;* so that it may yet be a matter of doubt, whether a mean of Mr. Hamilton's and of Captain Hayes's should not be resorted to.

The line to Smyrna closes with the 11 G. miles from Menimen. The road leading very circuitously round the head of the gulf, the practice is to cross it; and thus it is difficult to fix the time; but the land part of the journey is rated at 3 hours.

CHAPTER V.

RUM-ILI.

THAT part of Rûm-Ili bordering on the Black Sea, and Sea of Marmora, and extending inland to Adrianople and Rutchuk on the Danube, (that is, 70 to 90 miles), appears in a very defective state in our present books of geography. And since the Black Sea was to form a part of the present work, it became necessary to fix the positions of places in the neighbourhood of its shores, in order that the geographical connection might be preserved with the positions on its shores.

Another reason, moreover, occurred for extending those positions farther inland along the Danube; which was, that the tract had become so frequently the seat of war, that the passage of that river between Rutchuk and Jurja (called also Giurgevo), as well as at Tutrakan, Silistria, &c. were in a manner called for; as well as Shumla, and the passage of Mount *Hæmus*.

Through the long extent of the tract in question, which is from the 41st to the 45th degree of latitude, no celestial observations for the longitude occur; they being confined to the two extremities

north and south; to Ismael and Bucharesti on the north; Constantinople, Selivria, Rodosto, &c. on the south. Nor are there any latitudes by observation throughout the inland part. To this may be added, the disadvantageous form of the tract, for establishing geographical positions, by means of *cross lines* of distance; since it is not only *narrow*, but of a *crescent*-like shape; evading, as it were, the application of the *proportional* scales, founded on the length of the aggregate space.

Nothing could be more favourable, as a groundwork, at the south end, than the celestial observations, eight in number, including Tarapia and Eno. Nor is the opposite extremity deficient, there being one at each corner, Ismael and Bucharesti [1].

On the east, or maritime side, we profit by the Russian surveys, or observations, along the whole coast; since their land observations extend southward to the gulf of Foros; and their sea chart em-

[1] Latitudes and longitudes in Rûm-Ili, by celestial observation.

Places.	Lat.	Long. from Greenwich.
Constantinople, at the Seraglio . . .	41° 1′ 30″	28° 55′
Tarapia	41° 8′ 24″	29° 0′ 30″
Selivria	41° 4′ 30″	28° 11′
Heraclea	41° 1′	27° 54′ 30″
Rodosto	40° 58′ 30″	27° 25′ 15″
Gallipoli	40° 25′ 30″	26° 37′ 30″
Panagia Rocks . . .	40° 36′ 30″	26° 42′
Eno	40° 42′	25° 58′ 30″
Bucharesti	44° 27′	26° 8′
Ismael	45° 21′	28° 50′

braces the whole; and this is apparently the best feature of it, after the surveys along their own proper territory. Still, however, the longitudes from celestial observations are wanting; and the charts can only be reckoned on as far as the *actual surveys* have extended. But, notwithstanding these defects, it may doubtless be assumed, that no better *data* exist for these longitudes along the coast than the Russian maps and charts. On the west, all is void; nor do the Russian maps appear to be good, higher up the Danube than Silistria. And we conceive it to be understood, that in the grand Russian map of 1800 nothing is regarded as being exact and complete, save their own proper territory: however, an exception, for particular reasons, is to be made, for a great part of the tract beyond their proper territory on this side.

The present subject is divided into four Sections, answering to the numbers, 23, 24, 25, and 26, in the Maps of Positions, No. X. and XII.; and of which Sections the following is an abstract:—No. 23 relates to the placing of Adrianople. It is necessary that it should be fixed, in the first instance, in order to obtain the positions of Araba-Bourgas, and Kirk-kilissa; from which former, the line (24) is to originate, by which the *proportional scale* of distance is to be regulated. This line, 24, extends, in effect, from Rodosto to Ismael: but that part of it, applicable to the just-mentioned purpose, is confined between Bourgas on the one hand, and Karasu, taken to be the termination of the Russian surveys

(of the more exact description) on the other. The principal points arising on this line; namely, Kirk-Kilissa, Karaboonar, Provadia, and Bazardjik, derive their *longitudinal* positions from certain points on the sea-coast, by the medium of lines of distance; either collected by the author, or drawn from the Russian map; which, although erroneous in context, in many parts, furnishes many separate lines of distance and of bearing.

This being accomplished, a *second* line of proportional distance (No. 25) is extended from Adrianople to Silistria, on the Danube, through Karnabat, Dragoi, and Shumla; corrected longitudinally by a cross line, extending from certain positions on the coast, through Idos and Provadia.

No. 26 is a line from Varna, through Provadia, Shumlah, and Rasgrad, to Rutchuk, on the Danube; which latter is adjusted by the meeting of the line in question with another from Bucharesti; a place fixed by celestial observation.

Besides these four principal lines, there are many inferior ones, which link the principal ones together, and serve as collateral proofs of the truth of the general context.

But previous to the discussion of these inland lines, it will be proper to mention certain points that have been assumed, in position, on the sea-coast; or, in other words, *adopted*, from what were deemed the best authorities. No other means presented themselves, by which a meridian line could be drawn between Constantinople and Ismael. The points

assumed are Varna and Bourgas, on the coast; and Akkiolo and Eminy Boroun are adopted from the Russian map, with trifling alterations [1].

Varna, in the Russian map and chart, stands in longitude 27° 49′ E. of Greenwich, (or 1° 6′ W. of Constantinople.) In the chart of Ibrahim Effendi (1729), the longitude is precisely the same, in respect of Constantinople, within half a minute; being 1° 5′ 30″. M. D'Anville placed it 4 minutes to the E. of the Russians.

With respect to the latitude of Varna, *all* accounts are nearly agreed, with the exception of the Russian sea chart. That chart has 43° 7′ 30″, but the Russian land map, 43° 17′ 45″. The mean of nine other reports of its latitude gives 43° 15′ 20″; amongst which, Ibrahim has 43° 15′, and M. D'Anville, 43° 14′. The lines of distance, from the inland side, agree best with the latitude of the land map.

We have adopted for the latitude, 43° 14′, and longitude, 27° 49′.

Bourgas, in the same map, has its longitude 27° 30′ 30″. In ours, it is 27° 29′ 15″, by our correcting the scale of the gulf of Foros. The latitude is given at 42° 29′ 30″, which we have taken at 42° 31′. These of course are only *shades* of difference.

Karasu, between Zernawoda and Baba, preserves the original position given it in the Russian land

	In Russian Map.		Adopted.	
	Lat.	Long.	Lat.	Long.
[1] Akkiolo . .	42° 35′	27° 40′ 30″ .	42° 35′	27° 40′
Eminy Boroun	42° 42′ 30″	27° 52′ .	42° 42′	27° 50′

map, in respect of the celestial observation at Ismael; but it was found proper to add 2 miles to the breadth of the narrow tract on which Karasu stands; so that it is $24\frac{3}{4}$, instead of the $22\frac{3}{4}$ G. miles of the Russian map. All beyond Karasu, to the north, is from Russian authority; either the land or the sea chart.

The sea-coast being adopted, will serve as a kind of *border of fixed positions*. We proceed now to the consideration of the inland lines.

SECTION XXIII.

Adrianople, &c.

It is not known whether its latitude has ever been taken by any European, since the date of improvements in astronomical instruments. We have the following statements of it.

Ibrahim's map .	41° 45′
D'Anville . .	41° 41′
Regnaut, 1629 .	41° 45′
Bowen, 1715 .	41° 46′
Delisle . . .	41° 42′ 30″
Mean of five .	41° 43′ 54″

We adopted 41° 42′ 30″, as a mean, between D'Anville, Delisle, and Ibrahim; but there is little difference between that and the general mean.

Adrianople is stated to be 44 hours[1] from Constantinople, through Selivria and Araba-Bourgas[2]. Selivria, at the end of the first 12, is fixed by latitude and longitude; so that there remains 18 to Bourgas; 14 thence to Adrianople.

From the Seraglio to Selivria, by the observations, is 33 G. miles; giving a rate of $2\frac{3}{4}$, which appears high. Perhaps the distance was reckoned from the west end of the city, or the Seven Towers.

Araba-Bourgas, at 18 hours from Selivria, (at the rate of 2·6, arising on the long line of distance in Rûm-Ili; see the next article,) should be 47 G. miles, nearly, from it. And it being also 10 hours, or 26 to the NNW. or N. by W. of Rodosto, fixed also by celestial observations, we are enabled to place Bourgas in lat. 41° 23′. It is also 18 hours west, southerly, from Midya, on the sea-coast (Mr. Duff's report); and the space on the construction is 45 G. miles; agreeing very well. It is of importance, that Araba-Bourgas should be rightly placed, as the northern line (24) commences here. Midya (or *Salmydessus*) is placed according to the Russian chart, but agrees well with Pococke's report, that it is 18 hours to the NW. of Constantinople.

The 14 hours, equal to 36·4 G. miles, laid off from

	Bell.	Thornton.	Hawkins.	Baldwin.	Jenour.
[1] Constantinople to Selivria	12	12	13	12	12
Bourgas	18	18	18	18	18
Adrianople		14	14	14	14
	—	—	—	—	—
		44	45	44	44

[2] This, of course, is a different place from the one spoken of before.

Bourgas, to the parallel of Adrianople, 41° 42′ 30″, fixes that city at 114½ G. miles, in direct distance from Constantinople. The former authorities, on a mean of *seven* of them, give 111½. D'Anville has 115; Delisle, 106½; mean 111¾.

Adrianople is said to be 13 hours to the westward of Kirk-kilissa, which is itself 15 west-northerly from Midya. Hence Adrianople should be 72·8 G. miles from Midya, *through* Kirk-kilissa, which, however, is but little out of the line, being 8 hours to the northward of Araba-Bourgas. On the construction is measured 74¼ between them, or about 1½ difference.

The Roman Itineraries agree very well with the modern reports. From Constantinople to the *ancient Heraclea*, which is determined by the celestial observations, the distance is 45½ G. miles, *direct*. The Antonine and Jerusalem Itineraries have, at a mean, 64⅓ MP.; equal to 45·9 or 46[1]. And from thence to Adrianople the Antonine has 102 MP.; equal to 72·8 G. miles. On the construction, this space will be found to be nearly 74. It must be noted that Heraclea lies far out of the direct road, from Selivria to Adrianople; so that the ancient road made a great angle.

From the same authorities it may be collected, that Adrianople is consistently placed, in respect of *Enos*, or Eno, at the mouth of the Hebrus; for the Antonine Itinerary and the Theodosian Tables

[1] The Jerusalem has 66, (p. 570); the Antonine, 64, twice, (p. 139 and 323).

give from 89 to 92 MP. between them; and Eno, which is placed by celestial observation, both in respect of longitude and latitude, is about 65 G. miles from Adrianople: the mean of the two accounts is 64½, and it agrees well to the parallel of Adrianople.

It is, however, unlucky that a route of Mr. Chishul's, from Gallipoli to Adrianople, should be rendered imperfect by the omission of a few hours; as by its line of direction it would have approximated the parallel of Adrianople. The route, notwithstanding, is of great use in arranging some positions [1].

At Malgara, or Margara, 18¼ hours southward from Adrianople, he crossed the great western road from Constantinople to Salonica [2]. Taking 47½ G. miles for the 18¼ hours, and meeting it with 12 leagues from Rodosto, equal to 31¼, Malgara falls

[1] Gallipoli to Adrianople, by Mr. Chishul.

	Hours.
Gallipoli to the bridge of the Melas	4
Alalmalee	4½ (assumed.)
Malgara, or Margara	2½
Derrikui	7½
Uzun-kupri	2¼
Adrianople	8½

[2] Constantinople to the river Maritza (or *Hebrus.*)

	Hours.
To Selivria .	12
Rodosto . .	12
Malgara . .	12
Keissour . .	5
Ferer . . .	8

N.B. The Maritza was crossed at 9 hours beyond Keissour.

exactly in the line between the head of the gulf of Saros and Adrianople.

Again, Uzun-kupri (the long bridge) is $8\frac{1}{2}$ hours S. of Adrianople, or 22 G. miles. Dr. Pococke, having a line of 16 hours from Rodosto to it, places the bridge at 41·6 from the latter.

Demotica, or Dimotuk, *(Didymotichus,)* is 6 hours to the S. of Adrianople, on the west side of the *Hebrus*, or Maritza. Pococke makes it about $3\frac{1}{2}$ hours to the NW. of Uzun-kupri.

There is a useful line of Captain Hayes's from Rodosto to Gallipoli, 20 hours. On the construction, there are $52\frac{1}{4}$ G. miles; rate equal to 2·6. This route may be traced on Kauffer's Propontis, through Inegik (Yenejik), Kadikui, &c., and agrees very well. Al Saklar is probably near the bridge of the *Melas* and *Tekirdag*, or Prince's Mountain: and the remains of the *Hexamilia* were seen midway between Kadikui and Plaiar. Kadikui seems to be on the site of *Cardia* [1].

	Hours.
[1] Rodosto to Yenijik .	4
Al Saklar . . .	5
Kadikui	5
Boulingeer, or Plaiar	4
Gallipoli	2
	20

SECTION XXIV.

Line from Rodosto, on the Propontis, to Ismael and Maksin, on the Danube.

THIS line, of nearly 4½ degrees of latitude, has no observation to correct the parallel, throughout its whole extent. At Provadia, 8 hours from Varna, the parallel is approximated, by means of the general bearing of that place, given by Messrs. Hamilton and Thornton; and at Idos, a check is given to the parallel by means of the Russian map. Throughout the remaining part, the distribution of the distance depends on the proportions arising on the hours, or computed miles, on the road.

That part of the line towards the Danube (about ¼ of the whole) is included in the Russian surveys, and Araba-Bourgas, at the other extremity, has been already fixed, on the road to Adrianople; so that the extent to which the present enquiry is directed, is limited by Bourgas on the south, and Karasu on the north. The motive that led to a discontinuance of the use of the Russian materials, for the construction, was their not agreeing with the itineraries; the best tests for ordinary maps. And, in fact, a suspicion has arisen, that Karasu itself is brought *too far to the southward*, by several miles; but of this we have no *proof*. It does not appear that any latitudes have been taken, in the interior, to the south of the Danube.

Although we are in possession of several registers of the time, on this route, yet Mr. Bell's (of Aute-

mony) is the only one kept by the *same person throughout;* which is necessary to the forming of a good proportional scale. His register is in hours and miles, of which 3 make a league, and these are synonymous with hours in this place, and are equal to 2·6 G. miles, in direct distance.

Mr. Bell's whole number of hours, between Ismael and Bourgas, (the remainder to Constantinople is omitted at present,) is 97, producing 291 miles; of which 26 hours (78 miles) are between Ismael and Karasu [1]. This line forming a deep curve to the

[1] Part of the great road from Constantinople to Ismael.

	Bell.	Thornton.	Koehler.
Araba Bourgas to Kirkilisa	8	8	hours
Faki	12	12	12
Karaboonar	4	4	4
Idos *	8	8	7
Chengy	8	8	—
Provadia	5	6	6
Koslidga	—	4	4
Usheny	8	—	—
Bazardjik	2	7	6
Karasu	16	—	—
Ismael	26	—	—
	97		

For the first part of the road to Bourgas, see p. 313.

* Variation between Idos and Koslidga.

	Hours.
Idos to Nadir, south foot of *Hæmus*	2
Kupri-kui	6
Koslidga	9½
	17½

west, on occasion of the form of the coast, it became necessary to measure it, through the principal points through which it passes, in order to be enabled to form a proportional scale. When, therefore, the aggregate number of hours (97) were laid off on this curve, it appeared that the 26, which were the number between Ismael and Karasu, fell short of that place (that is, to the NE. of it) by 10 miles. This appears to be a considerable error, and may arise either from the defect of the Russian map, the error of Mr. Bell's register, or in the different nature of the road, from inequality of surface, or excessive winding. Or it may be partly from all the three. We have little doubt, however, that the map has its share of error, and that Karasu is at least a few miles more to the north. Whatsoever the cause may have been, we have not ventured to alter the position of Karasu, so many other positions depending on it; but have adapted a new rate to the part between it and Araba-Bourgas.

Between Karasu and Bourgas, then, there are 71 hours, or 213 miles [1], and the distance, measured

Bazardjik to Maksin.

	Boscovitz.	Thornton.	Bell.
Bazardjik to Alibeg-kui	7	7	8 hours
Osmanchi	$6\frac{1}{2}$	6	—
Karasu	$2\frac{1}{4}$	—	8
Karamurat	—	$6\frac{1}{2}$	—
Maksin	$21\frac{1}{2}$	21	—
	$37\frac{1}{4}$	$40\frac{1}{2}$	

[1] These seem intended by Mr. Bell, for British miles, but are certainly much longer; apparently in the proportion of 3 to 3·3; or nearly one-ninth more.

through the points of Bazardjik, Provadia, Idos, Karaboonar, Faki, and Kirk-kilissa, is 181¼ G. miles; giving a rate of 2·55, as nearly as possible. It may here be remarked, that Mr. Bell's rate, on the whole 97 hours, without any reference to the position of Karasu, is 2·6 G. miles; and between Bourgas and Constantinople it is 2·67. But that the southerly position of Karasu, by abridging the length of the remainder of the line, reduces the rate, as we have seen, to 2·55.

Mr. Bell's line may properly be divided into three parts; that is, between those points that have a connection with the sea-coast; namely, the intermediate ones of Provadia and Karaboonar, and the extreme ones of Karasu and Araba-Bourgas. That part between Karasu and Provadia contains 26 hours; between the latter and Karaboonar, 21; and, finally, to Bourgas, 24.

1. Provadia is 8 honrs, or 20¾ G. miles, directly inland, from Varna, and taken to bear a little to the N. of W. from it. For Beghirly, at 10 hours from Varna, and 2 NNW. from Provadia, is said to bear from W. by N. to WNW. from Varna. The intersection of the 26 *proportional* hours from Karasu, with the above-mentioned distance from Varna, places Provadia in lat. 43° 16′, or 2′ N. of the parallel of Varna. Had Mr. Bell's line been taken in the gross, Provadia would have fallen 5 or 6 miles further to the northward [1].

[1] The nature of the country is such, as to *shorten* the horizontal or direct distance, on the *south* of Provadia, and thus to

The Russian map places it about W. by S. from Varna; but, besides that the above report of its bearing appears to be *founded*, we cannot but remark, that the inland part of that map, to the south of Chernavoda, is very incorrect, as is shewn by a comparison of the routes of travellers with it. But, notwithstanding, its matter may be made useful, when the principal stations are arranged. It extends, southward, to the gulf of Foros.

It is proper to be remarked, that the great northern road divides, at the southern foot of Mount *Hæmus*, and joins again at Koslidga, 4 hours to the northward of Provadia: so that this latter place stands on the westernmost of the two; and the other passes through Defné, or Devenli, about 6 or 7 miles to the eastward of Provadia.

Bazardjik is a point in the line between Karasu and Provadia, at 10 hours or more from the latter; and 16 hours from Silistria; according to General Koehler: taken at 41½ G. miles. The Russian map has very much mistaken the position of Silistria, placing it 33½ from Chernavoda, and so near its parallel, that the difference of latitude is only 4 min. between them. It is placed on the construction, 28½ from Chernavoda; and 12 instead of 4 min. to the southward of it: that is, in lat. 44° 11′ 30″.

bring it more to the south, had the proportional distance *alone* decided it. For there is a great deal of hilly and rugged country on the south; much flat country to the north. This circumstance, therefore, is in favour of the Russian position of Karasu.

2. Karaboonar divides the other two portions of Mr. Bell's line; of which 21 hours are between it and Provadia; 24 between it and Araba-Bourgas; so that, in effect, Karaboonar regulates the positions between Provadia and Araba-Bourgas. It is itself regulated, in respect of parallel, by Mr. Bell's proportional scale; but it appears to agree also with its reported bearing and distance from Bourgas, on the gulf of Foros; from which it is said to lie south-westward, 6 hours. Benli and Idos, which are connected with Karaboonar, also agree with the positions at the sea-coast.

Karaboonar is 18 hours to the north-eastward of Adrianople.

The chain of Mount *Hæmus* (now called Balkan) extends across the line, between Provadia and Karaboonar. The town of Idos, situated at 2 hours beyond its southern foot, is placed by Bowen, W. 20° N., 23 G. miles from Akkiolo; and is on our construction 21, in much the same direction: which shews that the old maps have much of useful matter in them, if we knew how to discriminate it.

The village of Nadir stands at the southern foot of the chain, which is 6 hours of travelling across. The road divides here; the left hand, or western branch going through Provadia, the right through Defné; and both uniting again at Koslidga, after 15 or 16 hours from the separation. Chengy lies at the northern foot of *Hæmus,* in the Provadia road; Kuprikui, in the other; and both are situated on the Kamchuk river, the *Panysus* of the

ancients [1]. The Roman roads passed to the eastward of the modern ones; and in some places skirted the sea-coast, in the way to *Durostorus*, or Silistria.

3. Between Karaboonar and Araba-Bourgas, 24 hours in distance, occur the stations of Faki, Kogiæ-Tarlæ, and Kirk-kilissa. The latter has already been spoken of, under the article Adrianople; the second appears to be the *Tarpodiza* of the Antonine Itinerary, through which the Roman road passed, between Adrianople and *Odessus* (Varna); and at the former place, Faki, at 4 hours to the SSW. of Karaboonar, 14 from Adrianople, the great northern road from Constantinople divides; the right, as we have seen, to Provadia and Ismael; the left to Karnabat, Shumla, &c.: and which will be the subject of the next article, (XXV.)

SECTION XXV.

Lines from Constantinople and Adrianople to Silistria, &c.

THESE lines fall into each other at Karnabat; and although considered here merely as mathematical lines, to aid the construction of the geography, and therefore selected and arranged accordingly, are the lines of the great roads leading from Constantinople

[1] The Russian map allows only 21 G. miles between Chengy and Koslidga, although it be 10 hours, or 26 miles.

and Adrianople to Silistria, Tutrakan, and Rutchuk; three great passes over the Danube, to Walakia and Moldavia. After uniting at Karnabat, they form one road as far as Dragoi, at the northern foot of *Hæmus*, where they separate; the right going to Shumla and Silistria; the left to Rasgrad and Rutchuk. At, or near Rasgrad, a road turns off to the right, to Tutrakan. Some proceed by way of Shumla, to Rutchuk, falling into the Varna road at Rasgrad.

The authority for the road from Adrianople to Silistria is from M. Sturmer, the Imperial Ambassador, obligingly communicated by Mr. T. Thornton. Many parts of it are confirmed by Messrs. Thornton, Chishul, and others; as will appear by the Tables. M. Sturmer's line may be divided into three parts: 1. Adrianople to Karnabat, 24 hours; 2. Karnabat to Shumla, through Dragoi, 16 hours; and 3. Shumla to Silistria, 20 hours: total 60 hours [1].

The space on the construction, between Adrianople and Silistria, in a straight line, is 152½ G. miles: and although the points of Karnabat and Shumla lie but *little* out of that line, yet, measured through

[1] Adrianople to Silistria, on the Danube

	Sturmer.	Thornton.
Kutchuk Derbend . . .	10	— hours.
Yenikui	5	—
Karnabat	9	—
Dobral	4	4
Dragoi	8	8
Shumla	4	4
Silistria	20	—
	60	

those points, the distance is 155. Accordingly this detailed rate, which is the one applicable to the construction, is 2·58, or nearly 2·6; whilst the other was 2·54. Then each part of the line, according to this result would be:

	Hours.	G. Miles.
1. Adrianople to Karnabat	24 at 2·58	62·0
2. To Shumla . . .	16 ——	41·4
3. To Silistria . . .	20 ——	51·6
		155.

Karnabat is to be considered in respect of the Constantinople road, as well as that of Adrianople. From Faki [1], where the road turns off, it is 11 hours to Karnabat. The first 5 hours are to Bey-Mahalesi; which place being also 2 hours NW. from Karaboonar, will be fixed accordingly. For the 11 hours, as the road is exceedingly rough [2], 2·4 *per*

[1] Faki to Rasgrad, and Rutchuk.

To Faki, (see p. 313—318.)

	Thornton.	
Faki to Bey-Mahalesi	5 hours	
Karnabat	6	
Dobral	4	N.
Chilikuvak . . .	4	N. by W.
Dragoi	4	
Shumla	4	NNE.
Arnautkui	6½	
Rasgrad	1½	
Rutchuk	12	NW.
Bucharesti	16	

[2] This is the idea given by Boscovitz, between Karaboonar and Karnabat.

hour may suffice; and we have 26½ G. miles for the distance of Karnabat from Faki. Mr. Thornton informs us, that Karnabat is 4 hours from Idos; but, from other circumstances combined, one must conclude it to be more; and we have accordingly taken it at full 5; or 13½ miles.

The meeting of the lines from Faki and Idos places Karnabat at 61 G. miles from Adrianople; which, differing only 1 mile from the separate result from Adrianople, is a strong confirmation of the truth of the position of the latter.

2. Shumla is the next point in this line. This interval is complicated; for it crosses *Hæmus* obliquely, and thereby increases the loss by winding, by continuing longer within it. But this is fully made up to the traveller, by the beauty of the scenery; particularly in the valley of Chilikuvak [1].

The parallel of Shumla depends entirely on M. Sturmer's line to Silistria; but for the immediate part of that line between Karnabat and Shumla, we have the benefit of Mr. Thornton's time, bearings, and remarks. In respect of its distance from the sea-coast, we have very satisfactory lines of distance from Mr. Hamilton and Mr. Thornton; so that no-

[1] The exclamation of Virgil,—*Oh! quis me gelidis in vallibus Hæmi*, &c. is familiar to every one. The description of the delicious vale of Chilikuvak, in the very bosom of Mount *Hæmus*, by Messrs. Chishul and Boscovitz, would lead one to suppose that Virgil took his ideas from this spot; for it lay in one of the roads between *Byzantium* and the Danube. *Nicopolis ad Hæmum* is on this very road.

thing is wanting to such kind of authorities as we must work with.

Dobral lies at the southern foot of *Hæmus*, 4 hours north from Karnabat. Thence, across *Hæmus* to Dragoi, by Chili-kuvak, is 8 hours, about N. by W. (Here we enter the plains of Bulgaria, or ancient *Moesia.)* And thence to Shumla, 4 hours, *generally* north and north-east, but very crooked. For these 16 hours, collectively, 40 G. miles are allowed.

Shumla is 16 hours from Varna, by the joint reports of Messrs. Hamilton and Thornton. For these, which lead through a fine country, 42 G. miles are allowed; which, meeting the 40 from Karnabat, place Shumla in latitude 43° 20′ 30″, or 6½ min. to the northward of Varna; agreeing with the general bearings given by the before-mentioned gentlemen.

3. The interval remaining, for the third portion of the line between Shumla and Silistria, is on the construction 53½ G. miles, for the 20 hours; giving a rate of 2·67 and upwards. The road lies through the fertile and beautiful country of Bulgaria; so that the rate does not appear too high.

The table of distances from Faki to Rutchuk and Bucharesti requires no explanation more than has been already given. It is given at length in page 325, to prevent the trouble of several references.

SECTION XXVI.

Line from Varna to Rutchuk, on the Danube.

THIS, although spoken of as a single line, is composed of two, generally; and, in part, of three lines; but originating and terminating in the same points of Varna and Rutchuk. These lines mutually strengthen each other by their results.

The first line leads from Varna, through Provadia, Shumla, and Rasgrad, 36 hours. This is from Mr. T. Thornton, who paid very particular attention to all the different roads through which he passed, in this country. Tables of this, and the other roads, are subjoined; to which we beg leave to refer, for the detail [1]. Shumla is 16 hours (as before remarked) from Varna; and lies about 9 miles to the southward of a straight line drawn between Varna and Rutchuk. From thence, Rasgrad is 8 hours, in a direct line towards Rutchuk; which is 12 farther. Thus the 36 are completed, and may be taken at 2·6 *per* hour, making a total of $93\frac{1}{2}$ G. miles; or, deducting for the angle at Shumla, $92\frac{1}{2}$.

The second, and more direct line, leads by the

[1] Varna to Rutchuk, by Provadia.

	Thornton.
Varna to Provadia . .	8 hours.
Shumla	8
Rasgrad	8
Rutchuk	12
	36

north of Shumla, 6 or 7 miles, through Yenibazar, or Jenibazar, and Rasgrad; 36 hours, according to Mr. Thornton; 35 by Mr. Hamilton [1]. The third varies only by its leading from Varna to Shumla, by a more circuitous route than by Provadia [2].

It may be remarked, that the bearings given by Mr. Thornton give a general course of E. 17° 30′ S. from Rutchuk to Varna; and the construction has E. 20° S.; although Rutchuk is not placed on the absolute authority of these bearings, but from its distance from Bucharesti, a point fixed by celestial observations.

The distance between Bucharesti and Rutchuk is stated to be 16 hours, (reducing the *water* part of the journey to the same standard as the land); for which, at 2·6, 41·6 are allowed. The meeting of this line of distance with that of the line from Varna, 92½ G. miles (taking either the mean of the two accounts of 35

[1] Varna to Rutchuk, by Yenibazar.

	Thornton.	Hamilton.
Devenli, or Defné .	6	6 hours
Yenibazar . . .	6	6
Rasgrad	12	11
Rutchuk	12	12
	36	35

[2] Varna to Shumla, second road, by Boscovitz, &c.

	Thornton.
Varna to Defné . . .	6 hours.
Beghirli	4
Yenibazar	2½
Shumla	5
	17½

and 36 hours, or of the *corrected* distance through Shumla,) places Rutchuk in latitude 43° 48′. The Count Marsigli assigns 43° 45′; and M. D'Anville 43° 49′; but carries it 22 miles more to the west than our construction. In this respect, however, we agree within a mile of the Russian map, but differ very considerably in parallel, it placing Rutchuk to the north of 44°; which has the effect of giving the Danube a more easterly course than appears probable. It also increases the distance beyond our result, founded on the $35\frac{1}{2}$ hours, $12\frac{1}{2}$ miles, between Varna and Rutchuk.

Admitting the position of Bucharesti to be right, it is impossible that the Danube can run on a *more easterly* course than in the map; because of the distance given between Bucharesti and the three points of Tutrakan, Rutchuk, and Silistria. For from Tutrakan, Chishul allows $12\frac{1}{2}$ hours, which, at 2·6, are $32\frac{1}{2}$ G. miles: from Silistria, Mr. Thornton allows 18 hours, equal to $46\frac{3}{4}$ G. miles; and from Rutchuk, it has been already stated at 41·6. Had the course of the river been as described in the Russian map, Tutrakan would have been within 26 miles instead of $32\frac{1}{2}$; and Rutchuk at 32 instead of $41\frac{1}{2}$ [1].

The near approach of the course of the Danube to the shore of the Euxine, at Baba, or Tomiswaer, is a new feature in geography. The mean of eight

[1] In an old map of Bowen's are the following distances:

Bucharesti to Bazardjik	81,	on our map,	94
Rutchuk to ditto	83,	ditto	93

former accounts gave 34½ for the breadth of the land between; amongst which, M. D'Anville allowed nearly 33. The lowest was 27. The Russian map allows so little as 22¾ G. miles. The ancient course of the Danube between Rassovat and Baba has left a wide and deep bed, with standing pools, or lakes, at intervals; so that Ovid was right when he wrote that Tomis stood on the bank of the Danube.

It will be proper to note certain portions of routes, which, although not immediately used in the original construction, at large, apply to it satisfactorily, in detail; when the skeleton is formed.

The first is a route of Mr. Thornton's, from Koslidga to Maksin; from whence it may be inferred that Karasu is too far to the south. For his rate from Koslidga to Karamurat, 26½ hours, over 66½ G. miles of *level* ground, was 2·51; and over 55 miles of *hilly* ground, and in some degree affected by the windings of the Danube, the rate was 2·62. Again, Boscovitz, whose rate from the same Koslidga to Karasu, 55½ G. miles, over the same level ground, was 2·52 for 22 hours: but on 21½, over 61½ miles, mostly over the same ground with Mr. Thornton, between Karasu and Maksin, it was 2·85. Nothing can be more conclusive respecting the position of Karasu being too far to the south, in the Russian map.

When Boscovitz was at Bulbuler, a few miles to the southward of Karasu, he was told that there was a gulf, or inlet of the sea, 5 leagues to the eastward. That, of course, was the inlet of Baba.

There is a variation of route between Dragoi and

Rasgrad, travelled by Mr. Chishul. It passes by Eski Stamboul, taken for the remains of *Nicopolis ad Hæmum* [1].

It is impossible to quit the subject without returning our most particular thanks to Mr. Thornton, for the benefit of his own observations, and other communications. For, although we made use of Mr. Bell's Register, as being the most likely to produce an equable scale, throughout, an object particularly to be desired; yet it furnishes nothing more: whereas Mr. Thornton's remarks embrace every object that a compiler of general geography could wish; bating what was impossible in his situation to afford; that is, mathematical and astronomical exactness.

[1] Mr. Chishul's route.

Dragoi to Eski Stamboul	1 hour.
Boklar	4
Arnautkui	5
Rasgrad	1*
	11

* By other reports, 1½.

BOOK II.

ASIA MINOR.

INTRODUCTION.

ASIA MINOR is one of the most interesting portions of the great continent of Asia, in respect of its history and antiquities. From the early period of the Trojan war, and the splendid conquests of Cyrus, to the contests of the Romans with the *Gauls*, the *Seleucidæ*, and *Mithridates;* this has been a great theatre of military history. The establishments of the Greeks, which at once adorned and civilized the coasts of the three seas that nearly surround it; but more particularly those on the side of IÖNIA; have established an interest in the mind that has not even yet subsided; and has afforded an example of what may be accomplished with small physical means, when directed by wisdom, and executed with perseverance and courage.

Perhaps, no country is better fitted for the formation of an empire of convenient dimensions. Its peninsular form gives it the advantage of transport, afforded by three adjoining seas. It is placed in a happy climate, it has a great diversity of surface, a fertile soil, and is in general well watered.

It has the finest ports in the world, and the greatest abundance of naval stores.

The very flourishing state of it, in ancient times, may be inferred from the vast remains of cities and towns dispersed over it. And so completely had the ancient possessors availed themselves of the choice of commodious or defensive positions, afforded by nature, that there are few of the modern cities and towns but what stand on the sites of ancient ones. Yet is this highly gifted tract at present the most wretched of any: it has been depopulated by the bad government of the Turks; and, of course, uncultivated, except just in the environs of the towns: and it possesses little commerce more than what arises from the passage of a few caravans.

The ancients were in the habit of calling this tract, as they were indeed warranted by its nature, THE PENINSULA; as we apply the same term to Spain and Portugal, collectively. Nor do they differ much in size; the former being only one sixteenth part less, in point of area, than the latter. Its form is an *irregular parallelogram,* extending 550 to 700 miles (British) from east to west, between the parallels of 36° and 41°. It is confined between the gulfs of *Bithynia* and *Pamphylia,* to the breadth of 4 degrees; but expands to 6 between *Sinope* and *Anemurium.* And finally, between the gulf of *Issus* and that of the *Chalybes,* (the breadth of the *isthmus,)* it is again little more than 4 degrees. It has been usual to reckon the breadth of the isthmus between the gulfs of *Issus* and *Amisus;* but M. de Beauchamp's late observations having shewn that

there is no *deep* gulf at *Amisus* (Samsoun), and also that the form of the adjacent coast is very different from what was believed, it appears that the approximating part of the coast of the Euxine to that of the Mediterranean, is 75 G. miles more to the east than Samsoun; that is, between Fatsa and Kirason *(Phadisana* and *Cerasus);* and in the part where Xenophon places the *Chalybians.*

M. D'Anville most unaccountably narrows the isthmus, by a whole degree. It is difficult to account for this, as we find in Herman Moll (whose works we are too apt to contemn, though containing useful matter, even for the use of the present times), that *Sinope* is placed nearly in its proper parallel [1].

It is difficult to account for the source of this error, but it led M. D'Anville into many others; so as to derange completely that most beautiful work of his on Asia Minor. For, having annihilated in his geography a space of about 70 miles in breadth, throughout the central parts of that tract, (whilst his materials, it would appear, indicated that space to exist,) he has, in effect, *driven out* this space to the eastward, by closing the sides of his figure too

[1] Very preposterous ideas prevailed amongst some of the ancients, respecting the gulf of Amisus, which they represented as penetrating a vast way into the interior. The Periplus of Arrian, and the Theodosian Tables countenance this error, by the distances given; which were, doubtless, corrupted. In proof of this, we have not only the testimony of M. de Beauchamp, but of M. Tournefort's Journal, and of Ibrahim Effendi's Chart of the Euxine. For an examination of this question, see the Remarks on the Periplus of Arrian, lib. iv.

much. Hence, his longitude is exaggerated, nearly in the proportion that the latitude is narrowed: and Siwas stands at nearly a degree of longitude too far to the east, in respect of Sinope.

The ancients varied widely in this matter. Eratosthenes allows a proper width, 3000 stades; Herodotus shortens it to 5 journeys; Pliny to 200 Roman miles, which is about 100 too little. A report also prevailed, that from Mount *Argæus*, at *Cæsaria Mazaca*, the two seas were visible:—the Mediterranean, perhaps, might; but the Euxine was nearly 200 miles distant, and more than one chain of mountains intervened! Yet Strabo gives it as a report that prevailed!

The name, ASIA MINOR, does not *appear* to be of high antiquity. That part of it nearest to Europe seems to have been first called ASIA, as the name of a particular country, though eventually extended to the continent at large. Asia was afterwards extended to a larger portion of this peninsula: and at what time soever the name of *Lesser Asia* was finally applied, it must be allowed to have been conferred with propriety on a portion of that continent so peculiarly shut up; and, as it were, secluded from the rest.

The ancients divided Asia Minor into fourteen provinces, or, separating *Iönia* from *Lydia*, into fifteen; at the time that their knowledge of its geography enabled them in any degree to arrange it. But no system compiled after the time that their knowledge became perfect has reached us, (for Strabo wrote previous to that period): so that their

mode of division, finally, is as much to be collected from historical notices as from the statements of geographers.

Strabo, in different parts of his work, informs us, that the territories of *Mysia, Bithynia, Phrygia, Lydia,* and *Caria,* where they respectively joined, were so intermixed, that they could not be separated and described. The confusion between *Pisidia* and *Pamphylia* was still greater; whether they were to form *one* province or *two;* and even which of the names ought to be adopted. *Isauria* (the original country of that name, and not *Cilicia Trachea)* though described, is hardly classed, but is implied to be a member of *Pisidia.* This proves that the geography of this tract was very loosely arranged, at the date of Strabo's writings; and that where the indelible boundaries of sea-coasts, rivers, or mountains, were wanting, the line of separation was very often doubtful. Even that between *Iönia* and *Æolis,* which one would have supposed to have been the best ascertained, still floats in uncertainty.

In proportion as the geography of a distant country becomes better known to strangers, they go on to subdivide tracts that existed in their ideas before only as large masses. Therefore, in the application of ancient history to geography, one must be aware of this circumstance. Not only have portions of certain provinces assumed new names, as in the cases of *Galatia* and *Pontus,* which were respectively portions of *Phrygia* and *Cappadocia;* but the boundaries of provinces, taken at large, have

varied; as, for instance, *Cotyæum,* (which, under the name of the forum of the *Keramians),* Xenophon describes as the last city of *Mysia,* was afterwards placed very far within Phrygia. *Paphlagonia,* which, in Roman times, was contained within the *Halys,* extended to the neighbourhood of *Cotyora,* in the time of Xenophon. Great allowances, therefore, must be made, not only for changes, since the geographer cannot collect information that shall be *simultaneous* with respect to the state of things in different places; but also for misapprehension in those who collect so great a mass of materials, as that which formed the basis of Strabo's work.

It may be concluded that systems of geography of any real merit have seldom appeared in any age. Cicero would not have thought of undertaking a work of this sort, had there existed any one that was tolerable. Such even as Pliny's is, one may suppose that no better existed in his day.

In a national point of view, the improvement of geography is always taken up very late at home; since a coarse approximation to the truth answers most purposes; and abroad it cannot well be done, until a subjugation of the country has taken place. The moderns have less excuse for the imperfection of their geography than the ancients had; since the aids to modern surveying so far surpass the ancient: not to mention the compass, for which there could have been no substitute. We return to the immediate subject of the work.

The fourteen provinces into which the ancients divided Asia Minor, were,

Mysia,	Bithynia,
Lydia,	Paphlagonia,
Caria,	Pontus,
Lycia,	Phrygia,
Pisidia and Pamphylia,	Galatia,
Lycaonia and Cilicia,	Cappadocia.

Æolis formed the sea-coast of *Mysia*, southward of the Troad; *Iönia*, that of *Lydia;* that is, generally speaking; for Æolis was extended somewhat within the border of Lydia; and Iönia within that of Caria.

Pisidia and Pamphylia, though, doubtless, distinct provinces, cannot be separated in the discussion; and Isauria was a member of the former. Galatia and Lycaonia are said to have been originally parts of Phrygia; Pontus of Cappadocia; that is, Cappadocia, in more ancient times, occupied the space between Taurus and the Euxine; and Phrygia, the great body of Asia Minor, within the river Halys. Armenia Minor was a late distinction, applied to the countries situated along the Euphrates, and adjacent to the greater Armenia. In the middle ages the name was extended to Cilicia, which the early Mahomedan conquerors called Armen, or Armenia. Few traces of the names of the above provinces now remain; though those of the cities and towns may be generally recognized. We may, indeed, find *Lycaonia* in Kuniyah, or *Iconium;* which city might probably have given name to the province.

Carassi represents the *Carasena* of *Mysia*. Chanetes and Janik, *Genetes*, one of the names of *Pontus* in Apollonius Rhodius. The *Keramians* of Xenophon, whose forum appears to have been at Kutahiah, the Roman *Cotyæum*, have the name of *Kermian* in the geography of Abu Bekr Ben Behram.

The modern division of this country is, generally speaking, as unlike the ancient as possible [1]. It is thrown into four grand divisions, which contain, collectively, 39 subdivisions, under the name of sangiaks, or sanjaks. So that the moderns have more than double the number of the ancient provinces [2].

[1] The *entire* ancient divisions that agree very nearly with modern ones are the following:—

Mysia—with Biga generally.
Paphlagonia—Castemuni, almost entirely.
Cappadocia and *Pontus*—Rûmiyah, nearly.
Caria—Mûntesha.
Lycia—Tekè, nearly.
Lycaonia—Kuniyah.
Cilicia Trachea—with Itsh-Ili, *proper*.

[2] The author owes to his friend M. Hammer of Vienna, the means of access to the documents, which have enabled him to set forth his map of western Asia, and more particularly the quarter of Asia Minor, in the improved form in which it appears. This gentleman has, at different times, supplied him with almost every variety of geographical materials: that is, translations of the Turkish systems of geography; routes innumerable; both from living persons and from records; including his own travels; compass bearings, sketches, and remarks. In effect, he has evinced a zeal that could only be possessed by a man who sought reputation and distinction.

Amongst the translations are the following:—

1. Abu Bekir Ben Behram's Geography of Anadoli and Rûmiyah.

2. Karamania and Isth-Ili, by ———

The four grand divisions are: 1, Anadoli. 2, Rûm, or Rûmiyah. 3, Karamania. And 4, Itsh-Ili, with the Island of Cyprus. They are very unequal in point of extent. Anadoli is by far the largest; Rûm is in the next degree; but Karamania and Itsh-Ili very much smaller than either of the others.

Anadoli (whose name is adopted from the lower empire, meaning its eastern position in respect of the imperial residence) contains the country within the *Halys* from Anguri *(Ancyra)* to the Euxine. Along the Mediterranean, it extends to the gulf of Satalia, *(Pamphylia)*; and between Satalia and Anguri, its SE. boundary is deeply encroached on by Itsh-Ili and Karamania. In common usage, Anadoli (or Natolia) is applied to the whole extent of Asia Minor, though, as it appears, improperly.

Anadoli contains the ancient divisions of *Mysia, Bithynia, Paphlagonia, Lydia,* almost the whole of *Phrygia, Caria, Lycia,* the western half of *Galatia,* and a small portion of each of the divisions of *Pisidia* and *Pamphylia.* These, under the Turkish government, are arranged in 17 sanjaks[1]. The capital of Anadoli is Kutahiah, ancient *Cotyæum.*

As the shortest and most distinct mode of compa-

3. Armenia, Syria, and Palestine, Al Jezirah *(Mesopotamia)*, Irak *(Babylonia,* &c.), by Hajy Kalifa.

Translations of other divisions of his work were sent; but unfortunately miscarried.

[1] Namely, Biga, Carassi, Sarokhan, Aidin, Sagla, Muntesha, Teké, Hamid, Kootahiah, Karahissar, Sultan-Oghi, Khodavendkaur, Kodja-Ili, Boli, Anguri, Kangiri, and Castemuni.

rison, between the local positions of the ancient and modern divisions, a Table is subjoined, in which they appear opposed to each other.

Rûm, or Rûmiyah, contains generally the ancient *Cappadocia,* before the dismemberment of *Pontus* from it: that is, it includes generally the tract between the eastern Halys, and the Euphrates, Taurus, and the Euxine. It received its name from the circumstance of its having been so long the frontier province of the Roman empire, towards the Mahomedan conquerors, on the side of Syria; that it finally acquired with them the name of Rûm, or Rûmiyah, as happened to *Thrace,* from their being so long stationary on the Asiatic shore opposite to it.

Rûm contains the ancient provinces of *Pontus, Cappadocia,* generally; including *Armenia Minor;* and the *eastern* half of *Galatia.* In the present times it is divided into seven sanjaks[1]. Its capital is Siwas, the ancient *Sebaste* and *Cabira.*

Karamania is a much smaller division than either of the others, although divided into seven sanjaks[2]. It extends along the N. of Mount Taurus *(now* named the *Karamanian* Mountains, through the whole of Asia Minor), occupying in length from E. to W. the space between Rûmiyah and Anadoli; and extending northward, in a triangular form, the sides of which are formed by the boundaries of those countries, respectively. It contains, of the ancient divisions,

[1] Siwas, Amasia, Janik, Shuram, Bozook, Divrigui, and Arabguir.

[2] Kuniyah, Begshehri, Akshaher, Akserai, Kirsheher, Kisariah, and Nigde.

the *south-eastern* angle of *Phrygia*, and of *Galatia*, and the south-western quarter of *Cappadocia*. Also, the entire countries of *Lycaonia* and *Isauria*. Its capital is *Kuniyah*, the ancient *Iconium*. Kisariah, *Cæsarea Mazaca;* and Karaman, *Laranda*, are included in it.

Itsh-Ili, meaning the *interior* country, (although one cannot well understand the application to a tract bordering throughout on the sea-coast); is the last of the four grand divisions. It contains the whole tract lying between Mount Taurus and the sea, from the gulf of Satalia, to that of Scanderoon; that is, the ancient divisions of Cilicia *Campestris*, and of *Trachea;* with the eastern parts of *Pisidia* and *Pamphylia*. The island of Cyprus also belongs to it. It consists of eight sanjaks, of which four are on the continent, four in the island [1].

A TABLE,

Shewing the correspondence of the modern, with the ancient Divisions of Asia Minor.

Mysia and Æolis.	Biga, north of Ida and Temnus. Capital, Biga; olim *Zeleia*.
	Carrassi, south of ditto. Capital, Balikesr.

[1] Those on the Continent, are, Alaia, (or Alaja) Itsh-Ili *proper*, Tarsoos, and Sis.

Lydia and Iönia.	Sarokhan, or Magnesia, north of the *Hermus*. Cap. Manessa, olim *Magnesia*.
	Aidin, or Tireh, between the *Hermus* and *Mæander*. Cap. Tireh.
	Saglah, the Peninsula of *Clazomene*, and the northern part of Iönia. Cap. Smyrna.
Caria.	Muntesha. Cap. Moglah.
Lycia.	Teke, the western and largest part. Cap. Satalia, *(Attalea)*.
Pisidia.	Hamid, eastern part. Cap. Isbarteh, *(Baris.)*
	Teke, north-eastern part.
	Alaiah, north-western part. Capital Alaiah.
	Begshehri (ancient *Isauria.)*
Pamphylia.	Alaiah, greater part.
	Teke, eastern part.
Cilicia, Campestris.	Sis, at the gulf of Scanderoon. Cap. Sis.
	Tarsoos. Cap. Tarsoos, or Tarsûs.
Trachea.	Itsh-Ili *proper*. Cap. Selefkeh, olim *Seleucia Trachea*.
Lycaonia.	Kuniyah. Cap. Kuniyah, or *Iconium*.
	Nigde, southern part.
Bithynia.	Kodja-Ili, at the angle, between the sea of Marmora, the Euxine, and the Sackariah river. *(Sangarius)*. Cap. Is-Nikmid, olim *Nicomedia*.

Bithynia.	Boli, along the Euxine, between the *Sangarius* and *Parthenius*. Cap. Boli, olim *Hadrianopolis*.
	Khodavendkaur, northern part between the *Rhyndacus* and *Sangarius*. Cap. Brusa, olim *Prusa ad Olympum*.
Paphlagonia.	Castemuni, along the Euxine, between the *Parthenius* and the *Halys*. Cap. Castemuni, olim *Germanicopolis*.
	Kangiri, northern part. Cap. Kangiri, olim *Gangra*.
Pontus.	Janik, along the Euxine, between the *Halys* and *Trebizond*. Cap. Janik.
	Amasia. Cap. Amasia.
Phrygia.	Kutahiah, or Kermian. Cap. Kutahiah; olim *Cotyæum*.
	Sultan Oghi. Cap. of the same name.
	Karahissar. Cap. the same; called Aufium Karahissar; (ancient *Prymesia*).
	Akshaher. Cap. the same name.
	Hamid, western part.
	Khodavendkaur, south part.
Galatia.	Anguri. Cap. of the same name; anciently *Ancyra*.
	Kangiri; all but the northern skirts of it. Cap. Kangiri; (ancient *Gangra*).
	Shurum. Cap. Shurum, or Garom, near the *Halys*.
	Bozook, SE. of the *Halys*.
	Kirsheher, NW. part, at the *Halys*. Cap. Kirsheher.

Cappadocia.

Akserai, bordering on the *Lycaonian* hills. Cap. of the same name.
Kisariah, at the source of south-eastern *Halys*. Cap. of the same name; (ancient *Cæsarea Mazaca*).
Kirshaher, SE. part.
Siwas. Cap. the same name, and *Sebaste*.
Divrigui. Cap. the same name.
Arabguir, at the Euphrates. Cap. the same name.
Nigde, northern part. Cap. Nigde, olim *Cadyna*.

The surface of Asia Minor, in respect of its levels and ranges of mountains, is worthy of attention; and exhibits a singular appearance on the map. Every one has observed that the chains of mountains in the old continents generally range from west to east, or rather from the north of west to the south of east; that the steepest sides are those fronting the southward, or south-westward: and that the slopes or dips go off to the north-eastward. Or if the ranges run north and south, the steep side is to the west. In the tract in question, this general rule is fully exemplified; the commanding ridges run almost exactly east and west, the steepest and loftiest side is to the south, and the general level has a dip to the north; as is proved by the courses of all the waters that spring from the upper level.

The middle parts of this peninsula consist of a vast, elevated terrace, bounded on the south by the continuous chain of Mount *Taurus;* and on the north, by another of less elevation, under the ancient

names of *Ida, Temnus, Olympus,* &c. connecting finally with the Georgian *Caucasus,* by the intervention of the *Moschican* mountains. A lateral ridge in the western quarter of the peninsula connects the northern with the southern ridge; *Olympus* with *Taurus;* terminating the *high level* on that side.

It is not to be understood, of course, that this high level is generally flat; although, in certain parts, there are very extensive plains; and more particularly towards the central parts. Moreover, although the ascent from without is vastly greater than the descent towards the interior; yet *that* descent is still sufficiently great, to give the appearance of high mountains to the borders of the terrace from within. In effect, it is a terrace, bounded by high mountains: and has also some lofty ranges piled upon it; as, for instance, *Paryadres,* called by M. Otter, Chumla-Bell.

Paryadres is an intermediate chain between *Anti-Taurus* and the northern chain; and appears to connect with the latter, at the place where the *Halys* pierces it at Osmanjike; and with the *Moschi* or *Moschici* mountains of Armenia on the east. But the ancients themselves are not consistent in the description and extent of them. More will be found concerning them under the head of *Cappadocia.*

The high level may be reckoned to commence on the west, at the summit of Olympus, over Brusa; and on the east it continues into Armenia. Its breadth is from 180 to 200 British miles; so that, in the widest part of the peninsula it occupies about one half of its breadth.

The borders of the high level may easily be traced on the map; since the continuation of Olympus marks its northern edge, and Mount Taurus its southern; whilst the ridge named in modern geography, *Morad,* which connects by an oblique course from NW. to SE. Mount Olympus with Taurus; and, at the same time, separates the waters of the *Sangarius,* from those of the *Mæander* and *Hermus,* marks its western extremity.

As Taurus consists of several parallel ridges, united in different points by other *cross* ridges, a number of extensive basons, or elevated valleys, are formed; which constitute, almost universally, a part of the high level: being on the *interior* side of Taurus itself.

Anti-Taurus, which separates from Taurus in the line between Tarsus and Kisariah, and thence extends to the NE. over *Melitene,* is higher than Taurus, since the waters that flow from the south of it, penetrate Taurus; such as the *Sarus* and *Pyramus,* the *Melas,* &c. In fact, this appears to be the highest region in the *south* of Asia Minor. The remote, that is, the eastern branches of the Halys, flow from Anti-Taurus, and Mr. Sullivan found snow on its summits, in the midst of summer. The high level terminates on the Euphrates between *Samosata* and *Melitene.*

The great upland thus sketched to the mind's eye, contained, in ancient geography, the countries of Phrygia on the west; Cappadocia on the east; Galatia on the north; Lycaonia, Isauria, and other parts of Pisidia, on the south.

It would appear, that the tract which contains the sources of the *western* Euphrates, the *Aras, (Araxes)* the *Iris, Lycus,* and Eastern Halys, is, altogether, the highest part of this tract; since it separates the eastern and western waters; the whole way across from *Cilicia* to *Moschica.*

The rivers of the high level may be reduced to three. Each of these is formed of numerous branches, widely extended, and collected into one stream, before their descent to the middle or lower level. They all flow from the south, proving the northern dip before mentioned.

The *Halys* called by the Turks *Kizil Irmak,* or the *Red River,* but whose *proper* name is *Atoe,* or *Aitoe-su* (Aitoe river) is the principal one of the three [1]. Its fountains are very widely dispersed,

[1] The geographer Herman Moll calls it *Aito-zu* in his Map of Asia Minor. Dr. Howel writes it *Aitoe-su:* Mr. Jackson *Atoe-su:* none of them mentioning the name Kizil Irmak. It is well known that *Halys* was applied by the Greeks as a significant name on occasion of its saltness. (Strabo, page 546.) For it flows through extensive salt plains below Anguri; as we learn from Tournefort and Hajy Kalifa: and, perhaps, also in its course through Cappadocia, where the great salt lake, *Tatta,* is situated.

In the Antonine Itinerary we have a station between *Ancyra* and *Tavia,* named *Ecobrogis;* and in the Theodosian Tables, *Eccobriga,* both implying a town and bridge. In the Tables, *Lassoro* is the next stage towards *Tavia;* and Mount Larsar occurs, in a similar position, and near the *Halys.* Hence we suspect that the bridge was over the Halys, and that the *Ecco* or *Eco* had a relation to the proper name of the river in the country itself.

As Halys, or the Salt River, was a descriptive name amongst the Greeks; so is *Kizil Irmak,* or Red River, amongst the Turks.

some springing from Mount *Paryadres,* others from Taurus, in Lycaonia; so that they cannot be less than 280 B. miles asunder, although the remotest of them from the *embouchure,* is little more than 300. It was probably this circumstance which gave occasion to different authors, amongst the ancients, to place its source, some in the east, others in the south; both of which accounts were true; though each contended for one of them only. Collectively, its branches drain the western part of *Cappadocia,* and the eastern and northern parts of *Galatia.*

The eastern and largest branch, named the Tûm, is formed of various sources, in the neighbourhood of Siwas: some from *Paryadres* on the north; others from *Anti-Taurus* on the south, of the same valley or plain; but all within the space of 40 miles. Those from *Paryadres* form a river named Ildiz, from a lofty summit of that ridge. Another branch, named Koulam, rises at Kojhissar, and joins the former just before Siwas. A third rises at Ullash, from *Anti-Taurus.* The union of these streams forms the Tûm, which flows on a westerly course; passing about 20 miles to the N. of Kisariah, *(Cæsarea Mazaca)* until it joins the SE. head of the *Halys,* from the quarter of *Cybistra,* where the collecting waters flow to the NW. to the bridge of *Kesrekupre.*

The southern or lesser branch has its sources from *Mount Taurus,* in the neighbourhood of Kuniyah *(Iconium)* and Erekli. The former source bears the name of Kizil-Irmak (or Red River) at the very foot of *Taurus.* Passing Aksçrai, (supposed to occupy

the place of *Archelais, Colonia,* and *Garsaura),* it flows northward to the bridge of Kesrekupre, where it joins the eastern branch above described. The Red River then enters *Galatia* in a collective stream; and, after a very circuitous course, gains the sea, between *Sinope* and *Amisus;* dividing *Paphlagonia* from *Pontus,* in the lower part of its course.

Mr. Charles Vaughan judged it to be 160 yards broad at Osmanjike, where it has a beautiful bridge of 15 arches over it. Tournefort compares it to the Seine, near Anguri, where it was fordable. Tavernier calls it a *great* river at Kesrekupre. Mr. Vaughan remarked, that it was charged with red earth; from whence, probably, its present name of Kizil Irmak.

The second river is the *Sangarius,* or *Sagarius* [1], now Sackariah, which drains almost the entire of *Phrygia,* and the western half of *Galatia,* discharging itself into the Euxine, between the *Bosphorus* and *Heraclea* of *Pontus.*

It is formed of two principal branches; the one from *Phrygia,* in the SW.; the other from *Galatia,* in the SE.; and these of a multitude of lesser streams.

The Ailah, or principal branch from the SE., springs from the quarter of *Amorium,* but short of Mount Taurus. The *Alander* of Manlius (Livy, lib. xxxviii. c. 18.) appears to be the same name, and an adjunct of the Ailah. The Kirmer, from the

[1] *Sagarius,* as well as *Sangarius,* was in use anciently.

quarter of Anguri, in the E., and the Saka, or Sanga, from the mountains of Ala, in the NE., with many other streams of the torrent kind, join the Ala, near the site of ancient *Gordium*, now Sevrihissar [1], and altogether form a considerable river; for the Ailah is itself fordable above these confluences.

It may be conceived that the *Saka*, or *Sanga*, gives name to the main river, in the lower part of its course. *Pessinus*, now Bosan, stood on the Ailah, low down towards the conflux just mentioned; *Amorium*, high up, towards the source.

The Pursog, the ancient *Thymbris*, is the SW. branch, springing from the mountains of Morad, and receiving innumerable streams, from the SE. side of Olympus. It passes Kutahiah and Eski Shaher, the ancient *Cotyæum* and *Dorylæum*, and joins the Sackariah about two journeys below, and to the W. of *Gordium*. Descending from the high level, into *Bithynia*, it receives the *Gallus* (whose modern name we are unacquainted with), from the NW. side of Olympus, and gains the sea, at 30 miles lower down. Mr. Vaughan guessed it to be 200 yards broad within this interval.

The third river is the *Iris* of the ancients, of which it seems difficult to obtain the proper modern name [2]. It is formed from three principal branches,

[1] There are several places of this name.

[2] There is seldom any dependance on the names written down by ordinary travellers. Their information is either from the common guides *(Tatars)* or the caravan people, neither of whom know any thing more than the mere roads. Some other travellers may be said to carry the names abroad with them;

of which the one intended by the ancients for the *Iris, throughout,* is the middle one, though, perhaps, not the largest. It is named *Tozzan,* or *Tosan-lu,* and passes by the site of *Comana* (of *Pontus*), Tokat, and Amasia, and is fordable at Tokat. Mr. Vaughan guessed it to be 100 yards wide only, at Amasia. It is not navigable there. It has its source from the N. side of Mount *Paryadres.* The *Lycus,* which passed by *Neocæsarea,* now Niksar, is the eastern branch, and appears to be the largest; at Niksar, it is named Kelki (according to Mr. Morier); but, in the upper part of its course, Tournefort found it named Carmili. This branch comes from a remote point, eastward; passes near Karahissar, and under Kouli; thence by Niksar, and is said to join the Amasia river, at some miles below that city. The third is the *Scylax* of the ancients, from the SW., the

adopting them from the books they have read, whether right or wrong.

The generality of modern travellers have written the name of the Amasia river *Casalmak.* Some few, *Ermak,* or *Irmak,* which means simply *The river;* which, by the bye, is common to say, even in European countries. But even Tournefort speaks of the *Casalmac.* He was told that three rivers united towards Amasia: the Kouley-hissar, the Tosanlu, or river of Tokat, and the Casalmac; which last kept its name to the sea. But he also says that the Tosanlu or Tokat river (Tozzan) ran by Niksar, which Mr. Morier disproves from ocular demonstration; therefore it is probable that M. Tournefort's information altogether, in this matter, was derived from a bad source. He says the Tokat river is *not* the *Iris;* but this can hardly be doubted, after the description of the course of the Iris by Strabo, p. 547.

smallest of the three, and which joins the Amasia river at that city. The modern name of this branch is doubtful. It is probably the Shogerek of the Turkish geography, which is said to come from the quarter of Yuzdepary, which is to us unknown.

The final junction of these streams is at a point between 40 and 50 miles from the Euxine, when it forms a large body of water, discharging itself at Samsoun, the ancient *Amisus*, which lies almost due north from Amasia. The Turks name this collective stream *Sharshamba*, which, being applied also to the union of the heads of the *Mæander*, would appear to mean a general conflux of waters, and not to be a proper name. M. D'Anville says that its name is *Jekil-Irmak*, or the *Green* river. Tournefort tells us that the Carmili river (the same with the *Lycus*, the larger branch,) was of a *deep red* colour, from that of the soil. May it not be, that if the river was *red* at some seasons, and *green* (or fancied to be so) at others; that this may have occasioned the name of *Iris*, from the Greeks [1]?

It is probable that other branches, from the lower level, may join the Sharshamba river, before it arrives at the sea.

There is still much more required to be said, on the subject of this river, as it respects the comparison

[1] Arrian says, that "the colour of the water of the *Phasis* resembled that of water impregnated with *lead* or *tin*; that is, it may be concluded of a bluish cast." (Periplus Mar. Eux.)

The Turks have rivers named after the colours, blue, red, white, black, green. They call the *Melas* of Cappadocia the Black river.

of the ancient with the modern geography, and the illustration of ancient military history; but as many references must be made to geographical points, and to ancient history, it is reserved for the article of *Pontus*, through which country the Iris takes its course to the sea.

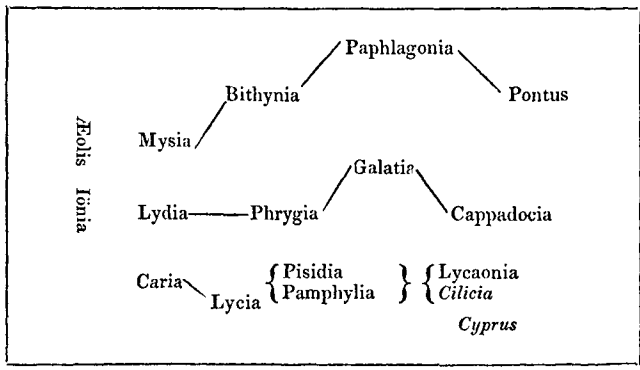
Provinces.

It is now proposed to enter on a description of the comparative geography of the provinces of Asia Minor, severally; adopting such an order of arrangement, as may convey the clearest idea of connection, as well in respect of their history, as of their geography.

In the last Section, there was set forth in a Table a comparative view of the division of the provinces, ancient and modern; in which is shewn what modern provinces constituted, or made parts of, the ancient ones; for as the number of the modern more than doubles that of the ancient, it happens in few instances, and only when the locality, in a manner, compels it, that the modern division corresponds with the ancient; but more commonly, that two or more of the modern are comprised in one ancient division, and in many instances are divided between two, or even more, ancient divisions. The Table will shew this in a clearer view than any other mode of description, and to that we beg leave to refer.

M. D'Anville has with great ingenuity and per-

spicuity, given an arrangement of these ancient divisions, that very much assists the memory in retaining an idea of their relative positions to each other, and which is here subjoined.



For they lie in three *layers* or *rows*, lengthwise, from W. to E., throughout Asia Minor; four in a row. By reason of the *swelling out* of the middle parts of this peninsula, to the N. and S., the two outward rows will of course have a *bend* outwards, whilst the middle row will have a small bend to the N. M. D'Anville has arranged Lycaonia with Phrygia, but it will appear that it ranges better with *Cilicia*, which mode we have adopted. He has also arranged *Pisidia* with *Pamphylia*, which is proper, on all accounts. And hence, the 14 provinces will be thrown into 12 divisions.

This arrangement of M. D'Anville's, however useful in aiding the memory, is not so well suited to our purpose, as an order of arrangement in the description. For the provinces, situated along the eastern

coast of the Archipelago, Mysia, Lydia, and Caria, including *Iönia* and *Æolis*, were so closely connected in history, as well as in geography, that it would be very inconvenient to the reader to separate them in the detail; although M. D'Anville's order of arrangement might suit very well in the abstract. For instance, the three provinces just mentioned, instead of following each other, and mutually explaining one another's boundaries and connections, would be separated by the intervention of three distinct provinces between each respectively; so that the thread of the subject, so necessary to be kept entire, would be broken; and the reader would have to recollect, when he came to *Caria*, what he had read concerning *Iönia* and *Lydia*, after being carried, in the interim, through *Phrygia*, *Galatia*, and *Cappadocia*, and without any advantage in other respects.

We have, therefore, begun with *Mysia*, and thence proceeded down to the coast to *Caria*, and from thence, along the southern coast, to Cilicia. After this, the reader will return to the N., and, from *Mysia*, go on eastward to *Bithynia*, and thence along the Euxine to *Paphlagonia* and *Pontus*, and finally, to the midland provinces of *Phrygia*, *Galatia*, and *Cappadocia*.

An advantage is gained, by taking the sea-coasts first. The line of the coast, by being familiar to the mind, furnishes a series of fixed stations in the imagination; and the maritime provinces being placed accordingly, on both sides of the peninsula,

the interior ones are easily adjusted to them; producing an effect which cannot be so easily attained by a contrary arrangement.

It has been already remarked, that the boundaries of these provinces, save only where seas, rivers, or mountains occurred, were very loosely given by the ancients. Strabo says (p. 564), that it was so very difficult to distinguish the respective boundaries of *Bithynia, Mysia, Phrygia,* &c., that it became *proverbial,* in respect of the two latter. After which observation, the reader will not expect any thing more than general ideas respecting the boundaries; although the relative positions of the different masses of territory to each other, as well as those of cities and towns, and other objects of geography, may be perfectly right. For nothing more than general descriptions, and those often imperfect, are to be found on record.

As the ancient names of cities and towns almost universally accompany the modern ones (where known), in the map, it would be a waste of time and room were they to be set forth in this place. An exception is only made to principal places, or to such as may appear to require a proof of their identity, from an established opinion having prevailed to the contrary of our positions. Such are *Archelais, Colonia, Celænæ, Pessinus,* &c.

The detail of the PROVINCES of Asia Minor will be comprised in six chapters.

I. Mysia and Lydia, with Æolis.

II. Iönia.

III. Caria.

IV. Lycia, Pisidia, Pamphylia, Isauria, Cilicia, and Lycaonia.

V. Bithynia, Paphlagonia, and Pontus. And

VI. Phrygia, Galatia, and Cappadocia.

CHAPTER I.

MYSIA, ÆOLIS, AND LYDIA.

Mysia occupied the NW. corner of Asia Minor; separated from Thrace by the Hellespont and Propontis, and washed by the Ægean Sea, or Archipelago, on the west. On the NE. it was separated from Bithynia, by the river *Rhyndacus*, now Mahalitch; eastward it joined to Phrygia Epictetus, although the boundary cannot be marked, because it falls within a tract utterly unknown to Europeans; there being no public roads that cross it, in any direction. Mr. Hammer's view of it from Mount Olympus shews that it is entirely mountainous. It appears to be the tract named *Abrettena, Azanitis*, &c. in Strabo; and of which he seems to have known but little; probably for the same reason that we are in ignorance [1]. On the south, Mysia joined to Lydia; but its border appears indefinite. M. D'Anville allots Thyatira and Apollonis to Mysia in the map; and he places both of them on branches of the

[1] Abrettena appears to have been situated between *Olympena* and *Temnus*, occupying the space that contains the western branches of the *Rhyndacus*. Morena probably lay on the south of *Temnus*.

Caicus, which appears to be wrong[1]. The whole course of the Caicus, with its branches, doubtless belongs to Mysia. The chain of mountains that terminates on the coast, at the Promontory of Cana, (now Coloni,) and which separates the valley of the Caicus from Thyatira, seems to have been the line of separation between Mysia and Lydia.

Strabo extends the length of Mysia between Olympena and Pergamus: but in earlier times it included Olympena, (Herodotus, Clio, 36); and Xenophon says that the *forum* of the *Ceramians* (Kutahiah, beyond a doubt,) was the *last* city of Mysia, in coming from the westward. But this afterwards stood in the centre of Phrygia Epictetus[2].

Mysia is represented in modern geography by the two Turkish sanjaks of Biga and Carassi. The first borders on the Ægean Sea, the Hellespont, and Propontis; and, on the inland side, is separated from Carassi by a long ridge of mountains, which, originating in Mount Ida, run eastward, and answer to *Temnus*.

The ancient country of Troas, and the remainder of the tract sometimes denominated the *Lesser Phrygia*, constitutes the western quarter of Biga;

[1] Although M. D'Anville places *Thyatira* in Mysia, in his map of Asia Minor, yet in his text he gives it to Lydia. There seems to have been a difference of opinion, anciently, concerning it. The promontory of *Cana* was supposed to be the boundary between Mysia and Lydia, on the coast; and inland, *Germa* belonged to Mysia; *Parthenium* and *Thyatira*, to Lydia. Strabo seems to have assigned Thyatira to Mysia.

[2] Mysia appears to have been about 130 British miles in its [illegible]om west to east; 90 to 95 in breadth.

Carasena the southern ; and *Dardania* and *Adrastea* the northern. Biga is the capital, and is the *Zeleia* of antiquity. In Carassi we trace the ancient name of *Carasena ;* although it be on a different side of *Temnus.* Carassi extends to *Lydia,* and includes *nearly* the whole of the coast, anciently called *Æolis ;* for a part of it extended into Lydia. Baliken is the capital, although *Pergamus,* now Bergamo, be included in it.

Mysia is a most interesting country, on the score of its containing so many places famous in ancient history : as, the *Troad,* the mountains of *Ida* and *Temnus,* the island and city of *Cyzicus,* with *Lampsacus, Dardanus, Abydus, Zeleia, Miletopolis, Caresus,* and *Pergamus.* Also the rivers *Granicus* and *Esepus :* and, for an appendage, the famous island of *Lesbos,* now Mitylene.

With respect to the Troad, Troy, and Mount Ida, the subject, being too extensive and intricate to be treated of in this place, is therefore reserved for a separate book. It will only be observed here, that Ida is a region, not a mountain, or single ridge, merely ; and that it extends from the promontory of *Lectum* (Cape Baba) to *Zeleia ;* recognised in Biga. This place stands at the side of a lake [1], through which the river Tarza flows. Strabo says of Zeleia (p. 587), that it is at the river *Tarsius,* and at 190 stades from *Cyzicus :* which circumstances agree to Biga, admitting (which can hardly be doubted) that the Tarza represents the *Tarsius.* And it is proper

[1] This will appear to be the lake *Aphnitis.*

to add, that at the mouth of the Tarza (in the Propontis) is a place named *Salis-dere*, meaning either *Salis* valley or river, and which may be the remains of the name *Zeleia*.

It must however be added, that Strabo speaks in another place (p. 576) as if Zeleia stood at the *Esepus* river, (which, if spoken of the town, would place it 12 or 14 miles farther to the west). But he says also (p. 587) that it was distant from the sea, at the *mouth* of the *Esepus*, 80 stadia. Now this is quite irreconcileable to the 190 stades from *Cyzicus*, since no point could be 190 stades from Cyzicus, and at either of the rivers in question, without being nearly as far distant from the sea as from Cyzicus. Therefore, 180 is probably the true reading; and in respect of Zeleia being at the Esepus, it might mean the *district* only; which probably included the courses of both rivers. Pliny (lib. v. c. 32.) certainly couples the Esepus and Zeleia together [1]. (See No. X.)

Certain travellers, and some of them of high respectability, in their way from Brusa to Smyrna, have taken the river of Mahalitch (the *Rhyndacus*) for the *Granicus*, without allowing themselves time to consider whether such a position accorded at all with history. And, in fact, it disagrees totally with history, as well as with the Theodosian Tables.

[1] Homer also—

"——— From Ida's foot,
Zeleia's wealthy sons, who drink the clear
Esepus."

But this may still apply to the *country*, through which the Esepus flowed, and not the town, (v. 954. Il. II. Cowper.)

Arrian shews that Alexander made very few marches between *Lampsacus* and the *Granicus*. The Theod. Tables give the following order, and distances:

Lampsacus	to Parium . .	22 MP.
	to Priapus . .	15
	to the Granicus .	27
	to Cyzicus . .	48
	Total .. .	112

But the whole distance is, indeed, not above 84 MP.: nor is the passage of the *Granicus* more than 42 or 44 from Cyzicus (by the road): however, this is sufficient to shew that the general position of the *Granicus* is not less than 80 Roman miles to the westward of the Mahalitch river; which is, in reality, the *Rhyndacus:* (as might be proved by the fact of the island Kalo-limno, the *Besbicus*, which stood opposite to the mouth of the *Rhyndacus;* (Strabo, p. 576): there being *no other island* on this part of the coast.)

Moreover, the *Granicus* flowed through the plain of *Adrastea*, between *Priapus* and the river *Esepus*, (Strabo, p. 587)[1]: and the position of this plain is unquestionable. We have the satisfaction also of the testimony of Mr. Chishul on this point, as he travelled from Susugherlick to Lampsacus; intersecting the courses of all the intermediate rivers, and noting the plains, lakes, and mountains; of which more presently.

[1] Pliny also places the *Granicus* to the westward of Cyzicus, (lib. v. c. 32.)

This line of route, together with the chart of the *Propontis* by M. Kauffer, discloses the whole order of position of the rivers that fall into the southern side of that sea.

Beginning at Karaboa, taken for *Priapus*, the rivers between this and the gulf of *Cius*, eastward, follow in this order: First, the Oostvola, the passage of which is 42 to 44 Roman miles west of Cyzicus, and therefore agrees to the *Granicus*. 2. The Sataldere, between the former and *Cyzicus*; agreeing to the *Esepus*. 3. The Tarza, nearly opposite to *Cyzicus*; agreeing to the *Tarsius*. 4. The Mahalitch river, opposite to Kalo-limno, or *Besbicus*; consequently, the *Rhyndacus*. 5. The Niloter, the Brusa river, which discharges at Diaskelli; agreeing to the *Dascylian* river [1]. And 6, and last, the Ghio river, at *Cius*, at the head of the *Cianus Sinus*, or gulf of Moudania; being the *discharge* of the lake of *Nicæa*, anciently *Ascanius*. The three last are properly belonging to Bithynia.

In proof of the position of the *Esepus*, we have the distance of its *embouchure* given by Strabo, at 700 stadia from *Abydus* (p. 591), agreeing to the Sataldere. And Demetrius of Scepsis (Strabo, p. 602) says, that the *Esepus* and *Granicus* flow from the east of Mount *Gargarus* (that is, *High* IDA, over *Antandros*) into the *Propontis*; and that the Esepus has a course of 500 stadia. This agrees also

[1] It forms, near its mouth, a very small lake; which, of course, may be taken for that of *Dascylium*; probably much smaller than in ancient times, like that of *Miletopolis*.

to the Sataldere: and the *Granicus* being (Strabo, p. 587,) between the *Esepus* and *Priapus*, the Oostvola must, of course, be the *Granicus;* for these are the only two rivers that flow from the east of Ida into the *Propontis*, or sea of Marmora. Neither of them are large. Chishul passed them both over bridges, at no great distance from the sea; and the Oostvola (according to Kauffer, for Chishul does not name them,) between the villages of Demotica and Pismetle [1].

There are several lakes in the north-east quarter of Mysia, at the distance of 10 or 12 miles from the Propontis. The most westerly of these is the Biga lake, before mentioned, through which the Tarza *(Tarsius)* flows. Mr. Chishul skirted its SW. side, and reckoned it 30 miles in circuit (overrated). He calls it Minyas, and confounds it with the lake of Mahalitch (Migales he calls it), or *Miletopolis.* Pococke saw it from Banderma, to the SW. 10 miles, and calls it Magriâs. This, no doubt, is the *Aphnitis*, or lake of the *Aphnei* Lycians. (Strabo, p. 587.)

The next eastward is the lake of Mahalitch, through which the western branches of the *Rhyndacus*, or river of Miletopolis, flows. This is now, in a great measure, filled up [1]: but Sestini saw it,

[1] Ptolemy places the *Granicus*, erroneously, on the *west* of *Parium;* but the *Esepus*, rightly, between *Parium* and *Cyzicus.*

[2] The filling up of lakes, and the addition of land to the coasts, by alluvions, occurs very often in this quarter of the world; and, indeed, every where: but here the ancient geography being on record, the changes are more easily traced.

to the southward, in his way to *Cyzicus*. This is the *Miletopolis* lake of Strabo, (p. 575), as well as the *Artynia* of Pliny, near *Miletopolis*, (lib. v. c. 32.) The other lakes bordering on the Propontis, as *Apollonia, Dascylium*, &c. appertain to *Bithynia*.

Having identified Mahalitch with *Miletopolis*, it is proper to give the authority; especially as M. D'Anville refers it to Balikesr, a town more than 50 miles inland.

In the Theod. Tables *Miletopolis* is 20 MP. from *Apollonia*, which is the distance of Mahalitch from Abolionte. And Chishul crossed a river, which runs through the lake to Mahalitch, named *Mulvetalee*: moreover, *Miletopolis* was near the sea, and not within the mountains, as Balikesr is.

From the northern quarter of MYSIA, we turn towards the western; to the *Hellespont*, the *Troad*, and *Æolis*.

In tracing the shore of the *Hellespont*, (now the Dardanelles and Strait of Gallipoli), from *Lampsacus* (Lamsaki) to *Sigæum* and *Ilium*, the agreement is clear between the ancient and modern names and distances. The river *Practias*, placed by Strabo between *Abydus* and *Lampsacus*, (p. 590), is by Arrian placed between *Lampsacus* and the *Granicus*. But, with M. D'Anville, we prefer Strabo's authority, as he states the distance also. Arrian may have transposed it, (as Xenophon has done the *Thermodon* and *Halys*, in his voyage from *Cotyora*, in lib. vi. of the Expedition of Cyrus the younger.)

Dardanus, at 9 MP. from *Abydus*, (Ant. Itin.) falls at the point nearly midway between the old and

new Castles; and agrees to the 70 stadia of Strabo, from *Rhœteum*. Thence, onward to *Alexandria Troas*, the distances in the same Itinerary agree with M. Kauffer's map of the Hellespont and Troad, which we have adopted, as far as to the *gulf* of *Adramyttium*.

But beyond Alexandria Troas, the line of distance is not always correct, or complete. The site of *Antandros* is pointed out by the distance of 35 MP. from Alexandria Troas, in the Ant. Itin., to be at or near Narli, a village on the north shore of the gulf of Adramyttium, and about 9 miles to the SW. of the peak of High Ida, or *Gargarus*. Strabo describes Gargarus as being *over* Antandros; and as that peak is a mile in perpendicular height, its base must, of course, extend several miles each way; and therefore the mountain may be said to be *over Antandros*. Strabo, p. 612, says, that the river *Cilleus* ran near this place; having its source in *Ida*. There is a river, descending from *Gargarus*, and running into the sea at Narli: nor is there any other river, in that quarter, that can be taken for the *Cilleus*. Mr. Hamilton names it Pazurli; another traveller, Papazley; and a third, *Papassio*.

Narli is at present a place of embarkation for large quantities of timber and pitch; as Captain Hayes, in his way to *Adramyttium*, had occasion to notice. The country within (back of Ida) abounds with pine trees. It was there that Strabo's *Pulchra Pinea* stood, (see page 603): and perhaps, as some local advantage recommends the site at present, so it may originally have pointed it out for the city of *Antan-*

dros. Æneas is said to have built his fleet at Antandros (Æneid. iii. 6.): if this be not true history, it shews at least that the poet knew where to fix on an appropriate situation.

Gargara, another city, stood on the same coast; and being placed by Strabo at 260 stadia to the east of *Lectum*, it falls at 5 miles to the west of Antandros. However, this alone is not sufficiently satisfactory, although it may well have been, that Gargara stood at 5 miles west of Antandros. But a circumstance seems to shew that it was nearly in that situation. The promontory of Gargara is said by Strabo (p. 606) to be 120 stades from that of *Pyrrha*, across the mouth of the gulf: and a lofty projection of the coast, at the place taken for Gargara, actually agrees in distance, from a promontory which may be taken for that of Pyrrha.

Assos, at 120 stadia east of *Lectum* (Baba), agrees to Bairam-Kalasi.

The inland positions of *Palæ Scepsis* and *Ænai* agree with Eski-Skupchu and Ene. For other particulars respecting the Troad and its neighbourhood, the reader is referred to the third book, which treats of the subject of *Ilium*.

Adramyttium (now Eidermit), and its gulf, require some explanation. The position of the town, at 56 MP.[1] from *Alexandria Troas*, agrees very well; but it is to be noted, that the termination of the gulf, to the extent of 4 or 5 miles, is sometimes dry, and at other times covered, according to the

[1] See the Geographical Construction, chap. iv. pp. 302, 303.

state of the winds. So that Mr. William Hamilton crossed over directly from Kiomer, in the direction of Ida *(Gargarus)*, that is, northward; whilst Captain Hayes went round by the head of the gulf, a circuit of 4 or 5 hours.

Captain Hayes discovered a hot spring at about 7 miles to the west of *Adramyttium*. Here too is a sheltered bay; and one may well conceive this to have been the site of the Temple of Apollo, at *Chrysa*, to which Ulysses was deputed, in the Iliad (lib. i.): and the bay, that in which his vessel anchored during his mission. *Astyra* was 30 stadia more to the west, and distant from the city of *Thebe* 70 stadia (Strabo, p. 614); which city was itself 60 to the northward of *Adramyttium*, or in the opposite quarter to *Lyrnessus*, (p. 612.)

Hence, the plain of *Thebe* lay to the northward of *Adramyttium;* and between it, and the ridge that runs eastward from *Gargarus*, named *Pedasus;* and which is the commencement of *Temnus*. Xenophon, in his way from Antandros to Adramyttium, along the coast, passed through the plain of Thebe. (Anab. lib. vii. near the end.)

Æolis.

Here we enter on the tract anciently named Æolis, which, in its proper sense, seems to have been confined between the gulf of *Adramyttium* on the north, and the river *Hermus* (Sarabat) on the south: in effect, a large portion of the sea-coast of Mysia, south of the

Troad; and a small part of that of LYDIA, adjacent. But in its most extended sense, it meant the whole coast that was colonized by the Æolian Greeks after the destruction of Troy; and extended to the promontory of *Lectum*, if not to *Ilium* itself[1].

Herodotus enumerates (Clio, 149) eleven Æolian cities; and Smyrna had made the twelfth, but was seized on by the Iönians. They were, *Pitane*, *Grynia*, *Myrina*, *Cume* (or *Cyme*,) *Neontichos*, *Ægæ*, *Larissa*, *Temnos*, whose situations are known; and *Cilla*[2], *Egiroessa*, and *Notium*, unknown. In this statement, *Pitane*, at the mouth of the river *Evenus*, (Cossak) is the most northern of the Æolic cities; so that the *two Cilicias* were not reckoned to Æolis in the time of Herodotus.

They also possessed in *Lesbos* five towns; another in Tenedos; and another in the *Hecatonesi*. Their territory seems to have been confined to a narrow border, along the sea-coast; and much more straitened than that of their neighbours, the IÖNIANS.

The two CILICIAS, *Thebe*, and *Lyrnessus*, occupied the space between Æolis and Mount Ida. *Thebe* has been already placed. *Lyrnessus* (the fortress) is said to have been at 80 stades from *Adramyttium*, in the opposite quarter to *Thebe*; consequently, *Lyrnessus* must have been to the south. It is described as a natural fort in the rock (Strabo, p. 612); probably nature had done much towards it, and art

[1] The Æolian migration is supposed to have taken place about 1096 years before Christ; and 41 before the Iönian migration.

[2] M. D'Anville places *Cilla* on the river *Cilleus*, by *Antandros*.

the remainder. Mr. W. Hamilton actually saw such a place, and in the general position assigned it, in his way from Pergamus to Adramyttium. A small stream named Cossak, which he crossed, near it, ought to be the *Evenus*, which discharged at *Pitane* (now Mattelas ?), and which is said to have passed near enough at the back of Adramyttium to supply it by means of an aqueduct. However, Mr. Hamilton saw a different river, that discharged itself into the head of the gulf, opposite to that place.

The district of *Pergamus* (Bergamo) occupies the SW. quarter of Mysia. (From *Olympena* to *Pergamus*, says Strabo). This celebrated place cannot be mistaken, either in respect of name or character. The different branches of the *Caicus* river, from the northern and eastern quarters, unite in the vicinity of this city, and gain the sea, at the distance of about 15 miles to the SW. at Yalea, the ancient *Elæa*. There appears to be a contradiction in the description of the origin and course of this river, even amongst the ancients themselves; which is ever the case when a river is made up of branches that flow from different quarters. It may be proper to begin with the notices afforded by late well-informed travellers; and then, inferring from those what the ancients intended.

Mr. W. Hamilton remarked, that three rivers unite at *Pergamus;* two forming a junction on the east of, and above, the town, and a third falling into the confluent stream below [1]. Of the two first, one

[1] M. D'Anville, in his map of Asia Minor, describes exactly the same number of streams, and in the same relative positions.

comes from the east, the other from the north-east: that from the east is formed, somewhat higher up, of two other distinct waters, that of Jelembe, or Baskolemba, a town on the high road from Brusa to Smyrna, and situated in a wide valley, which continues all the way to Pergamus, about 2 journeys lower down, and apparently extends high up, above Jelembe. We know no other name for this river than that of Jelembe, the name of the town. The other water comes from a point more to the SE. and is denominated from Bakker, a town near its source.

The former of these waters evidently flows through the valley or plain which took its name from the *Caicus;* and of which Strabo speaks in such marked terms, on the score of its riches and superior quality, in page 624. The Jelembe river, therefore, ought to be the *Caicus* designed by Strabo, which he says, page 616, rises in the plain; probably at the head of the valley in question [1].

The river that falls in at Pergamus, from the NE., appears to be the river of Balikesr; and seems to have a more remote source than the Jelembe or Bakker. Mr. Browne was very particular in his enquiries, concerning the future course of this stream from Balikesr; and he was assured that it joined the water of Jelembe; in effect, that it went to Pergamus. This river, therefore, as well in its origin as in its future course, agrees to the *Mysius* of

[1] In effect, the river Caicus is pointed out, by the marked character of the plain through which it runs, and to which it gives name. Xenophon extends the plain to Pergamus.

Strabo, (page 616), from Mount *Temnus*, at the southern foot of which Balikesr stands, and from whence the river has its source: first passing by Mendachor, answering to the *Mandropolis* of Pliny.

But here it becomes necessary to convince the reader, that this is really Mount *Temnus;* for M. D'Anville has placed Mount *Temnus* in a very different situation, and much more to the south. Most travellers also have applied the name of Temnus to the chain on the *south* of Balikesr, and between it and Jelembe.

The ridge of *Temnus* is a distinguished feature in the geography of Mysia, dividing it longitudinally from west to east into two, not very unequal, portions. The eastern or greater chain of *Ida*, commencing near *Ilium*, extends south-eastward to the neighbourhood of the gulf of Adramyttium, where it forms the lofty point denominated at present Kasdagi, which is the ancient *Gargarus* and *Cotylus*, overlooking Antandros and Gargara; and is, from ocular demonstration, the *highest part* of Ida. Ida does not terminate here; but only forms an angle, or kind of bastion, pointing to the SW.; for it changes its course to the eastward, as well as its name, which was *Pedasus*, in the part fronting Adramyttium; and which name that city itself bore, in early times, as we learn from Pliny, (lib. v. 30.) From thence it continues eastward, to Balikesr and Mendachor, where the great road from Brusa to Smyrna crosses it, at a place named *Demir-kapi*, (where the pass, on the side towards the Propontis, was shut up with a gate, of which the arch remains;

and the site, perhaps, that of *Hadriano-theræ)*; and passing still on to the east, to the confines of BITHYNIA and PHRYGIA, it finally unites with Olympus.

The proper name of this ridge, at least from the pass eastward, is *Tumanidje;* by some corrupted into *Doumani* and *Doumali:* there is also a town of the name of Tumanidje on the common frontiers of Mysia, Phrygia, and Bithynia; and a mountain over it of nearly the same name (Tamonedje) seen by Mr. Hammer from Mount Olympus, rising in a semi-circular form, and overtopping the rest, in what he calls "a sea of mountains [1]."

This chain, therefore, we regard as the TEMNUS of the ancients; for Strabo says, (in page 616), that Temnus lies *above* the plain of *Thebe;* and that we have already shewn to be adjacent to Adramyttium; and Ptolemy also places *Temnus* in the parallel of *Antandros,* separating the heads of the *Rhyndacus* and *Caicus,* as the before-mentioned mountains really do, not only of those particular rivers, but of all the waters that flow northwards into the Propontis, and south-westward to the Ægean Sea. To these authorities may be added that of the name of the ridge, *Tumanidje.* We return to the subject of the *Caicus* river.

Regarding, therefore, the Balikesr river as the *Mysius* of Strabo, we proceed to speak of the third river seen by Mr. Hamilton below Pergamus. This he regarded as having much of the character of a torrent: its origin and name he learnt nothing

[1] See above, page 362.

of. Strabo notices only the Balikesr and Jelembe branches. But Pliny (v. 30) speaks of the *Citius* and *Selinus,* two rivers that flow from Mount *Pedasus,* and thence to Pergamus. The *Caicus* he had previously spoken of: so one must conclude that his other two rivers are the torrent just mentioned, and the Balikesr river.

It should not be omitted, that Strabo states, (page 616), that Bacchylides says, that the Caicus flows from *Ida;* and which Strabo contradicts. The truth probably is, that Bacchylides regarded the *continuation* of Ida, before mentioned, as Ida itself; and the Balikesr river as the true Caicus.

The Caicus is said to preserve the name of *Kaik* to the present time.

Lydia.

The country of LYDIA is the next in order, going southward from MYSIA, along the coast of the Ægean Sea or Archipelago. On the east it has *Phrygia,* and on the south *Caria.*

The sea-coast of this province comprises, generally [1], the celebrated tract of IÖNIA; so named from the settlements of the Iönian colonies of the Greeks, there, about 1055 years before the Christian æra. But Iönia, in effect, constituted no more than a kind

[1] Generally, because *Iönia* extended within the boundary of *Caria.*

of border or margin along the sea-coast; and to the distance of a few miles inland: save only the great peninsula of *Clazomene*, and the two Islands of *Samos* and *Chios*. This being the case, it appears most convenient to go first into a description of the province at large; and, finally, into that of Iönia, as a separate subject.

MÆONIA was, in early times, the name of this country, and is now regarded as being synonymous with LYDIA. There was, however, a city of that name in the quarter towards *Tmolus* and PHRYGIA; and the country around it appears to have formed a province under the name of *Mæonia*. More will be said respecting the *Mæonians*, under the article of LYCIA [1].

The common boundary of Mysia and Lydia has been already stated to extend from the promontory of *Cana*, eastward, between *Germa* and *Thyatira*; leaving the former to Mysia, the latter to Lydia. Its southern boundary is admitted, on all hands, to be the course of the *Mæander*; and on the east was extended along it, at least as far as the place where Xenophon (with the younger Cyrus), crossed it, in the line between *Sardis* and *Colossæ*. Accordingly, *Tripolis* and its river may be regarded as the extreme eastern boundary of Lydia.

Xerxes is said to have entered Lydia, at *Kydrara*, a place between *Colossæ* and the *Mæander*, where Crœsus had formerly erected a pillar to mark his [2] boun-

[1] Homer speaks of *Mæonia* at the foot of *Tmolus*. Iliad. lib. ii.

[2] That is, not the boundary of the *province* of Lydia, but of the

dary. After this, Xerxes came to the separation of the roads that lead to Sardis and Caria. This spot may be conceived to have been about the site of *Laodicea ad Lycum*. Strabo says, (page 663) that at *Carura* is the common boundary of Phrygia and Caria; so that, supposing those of Lydia and Phrygia to have been at the river of Tripolis, the extremities of these three countries of Lydia, Phrygia, and Caria, fall in together nearly at one point.

The extent of Lydia eastward, along the course of the *Hermus*, is not known. *Attalia*, recognised in Atala, is the farthest *known* position in Lydia. Our ignorance of all that quarter prevents the knowing where to place the common boundary of Lydia and Phrygia. Towards the NE. of Lydia, the *Hyllus* or *Phrygius* springs from the neighbourhood of Mermeree; and on the edge of the *Hyrcanian* plain; although it has been represented to spring from a remote quarter, and from the borders of Phrygia. Mr. Hamilton visited its source. Our knowledge in that direction terminates with the *Hyllus*, now the Koompt, or Koompt-shay.

M. D'Anville appears to have extended the boundary of Lydia much too far to the east, by taking in *Alydda;* and advancing it a good way thence toward *Acmonia*. It is probable that it extended to the lofty ridge of mountains, crossed by Dr. Seetzen, between Kolah and Jenishehr (a continuation of that

empire of Crœsus. It is probable that the most western of the two rivers of *Laodicea*, at its conflux with the Mæander, was the boundary in question: and Kydrara might have been nearly the site of Laodicea.

named *Aglebashi*, by Tavernier), and of whose future course, northward, we are ignorant[1]. Under the general dimensions supposed, Lydia must have had an extent of 150 Br. miles, from west to east, in the longest part; and in breadth about 80.

LYDIA and IÖNIA are represented in modern geography by the sanjaks or Turkish provinces of Sarokhan, Aidin, and Sagla. Of these, the former contains the country traversed by the *Hermus*, and has *Magnesia ad Sipylum* (now Manessa), for its capital; and from which the province itself is also called Manessa. Aidin, which extends itself on the south, and nearly parallel to Sarokhan, contains the tract between Mount *Tmolus*, and the river *Mæander*; and Sagla, the western quarter of Lydia, consisting of the country around *Smyrna*, and the celebrated Peninsula denominated from *Clazomene*, *Erythræ*, and *Mimas*. In effect, the northern part of IÖNIA.

Lydia may be described, as made up of three *basons*, or valleys, opening to the Archipelago: each having its proper river, and separated from each other by mountainous tracts or ridges.

The first and northernmost (i. e. next to Mysia) is that of the HERMUS, by far the most extensive, rich, and populous. It has, on the north, the heights that extend from the promontory of *Cana*, passing over *Parthenium* and *Thyatira*; and which, in their

[1] As Pliny says that *Tmolus* has a communication with *Olympus* (as well as with *Cadmus*), this chain probably continues northward to a junction with *Temnus* and *Olympus*; and thus forms the communication.

course to the south-east, and to the neighbourhood of *Sardis*, approach so near to the southern boundary of the valley (Mount *Tmolus*), as to reduce the breadth of it to 7 or 8 miles. But by the mutual divergence of these ranges of heights, both in the east and west, the valley becomes upwards of 30 miles wide, from north to south, both above and below Sardis; which thus stands in a kind of strait connecting the two wider plains. The extent of this valley, or plain of the Hermus, from east to west, is little less than 100 miles.

Mount Tmolus does not itself extend far enough to the west, to bound the whole extent of the plain in that direction; but where it terminates, *Sipylus* begins; *linked* to it by a lower order of mountains. On the east, it is shut up by the high ridge crossed by Dr. Seetzen (the Aglabashi of Tavernier), which appears also to form the eastern border of Lydia. On the west, the plain opens to the sea between *Cyme* and *Temnus;* having *Phocæa* in front.

The *Hermus* river (now Sarabat, Yadis, or Kodos) springs from the western side of the mountains of Morad; a woody chain, which, passing between *Aufium* Karahissar, and Sandakly (*Prymnesia* and *Celœnæ*), links Mount *Taurus* with *Temnus* and *Olympus;* and which forms the western border of the high level of Asia Minor. The place of its source is named Kodos, perhaps the *Cadi* of Strabo, a Phrygian city. Thence, taking a SW. course, it enters Lydia, and traverses the plain in question, but dividing it into very unequal portions; for the part east of Sardis lies generally to the south of the

river; the part west of Sardis to the north of it. Anciently the Hermus gained the sea near *Phocæa;* but it has gradually withdrawn its *embouchure* higher up the gulf of Smyrna: so as to be much nearer to *Smyrna* than to *Phocæa.* And in order to this, it winds in a semicircle round the western extremity of Mount Sipylus. It has a number of adjunct streams; the principal are, the *Cogamus,* above Sardis from the quarter of *Mæonia,* in the south east; and the *Hyllus* from the quarter of Thyatira, in the NE.; and which falls into the Hermus, nearly opposite Magnesia.

The ancients divided the plain of the Hermus into several distinct portions, all of which are subjects of history[1]. Above Sardis, on the south of the Hermus, is the extensive plain of Cyrus, (mentioned by Strabo, page 629), in which the fate of the Lydian empire was decided by the victory of Cyrus the Great, over Crœsus. It is now called the plain of *Darius:* but it is well known, that this Persian term only means, in a general sense, ROYAL; and applies equally to CYRUS, as to DARIUS. At 16 or 17 miles to the eastward of Sardis, on the road to Philadelphia, are seen a great many large *tumuli* scattered over the plain. (Lucas.) This agrees circum-

[1] Strabo (page 629) enumerates a series of plains in Asia Minor, of which these form a part. It is certainly a most characteristic way of describing the face of a country, by its masses and chains of mountains, and the basons which they environ or border; since the courses of the waters generally intersect the basons. But Strabo's is little more than a *catalogue* of plains, without giving any clear idea of their respective situations.

stantially with the history of the warfare of Cyrus with Crœsus, in Xenophon's *Cyropædia;* where the field of battle of *Thybara,* or *Thymbra,* was within a day's march of Sardis. M. D'Anville has, without attending to the history, referred it to the *Thymbrium* of Xenophon, towards Iconium!

On the same side of the Hermus, *below* Sardis, and bounded by the mountains of Sipylus and Tmolus, is the *Cilbianian* plain, (Strabo, page 629) now Durgoothli, from a tribe of Turcomans who occupied it. And on the opposite side of the river is the plain of the Hermus, *properly* so named; extending from Sardis to the neighbourhood of the sea. Through this plain flows the small river *Hyllus,* (or *Phrygius);* on whose banks, near *Magnesia* of Sipylus, was fought the battle between Scipio Asiaticus, and Antiochus, surnamed the Great, (B.C. 190); in which the empire of Asia Minor passed into the hands of the Romans; as in the former case, into those of the Persians, 358 years before.

The fourth and last portion of this valley of the Hermus (taken at large) is the *Hyrcanian* plain, lying to the north of the Hyllus, between *Thyatira* (Akhissar) *Apollonis,* and a hilly tract named at present *Kirkagan,* or *Hirkagan,* in which may be traced the ancient name of the plain; and of a city, whose position is unknown; but thought by M. D'Anville to have been on the site of Mermeree. We should have looked for it farther to the northward. It is mentioned by Livy, (lib. xxxvii. c. 38.) on occasion of the march of Scipio towards the field of Magnesia; and is said to have received its name on

occasion of the planting an Hyrcanian colony from the shores of the Caspian Sea.

To the westward of this plain, and between *Apollonis* and *Pergamus*, stood the city of *Parthenium*, which is remarkable from its being the point at which the remains of that gallant army, usually called the TEN THOUSAND, joined Thymbron, the Lacedamonian general, in order to form an army, destined to invade the Persian possessions in Asia Minor.

The extent of Mount Tmolus appears to have been from the Mæander on the SE. to the Sipylus on the NW. extending its branches, though of a lower order, to a junction with Mount *Gallesus* (over *Ephesus*) to Mount *Corax* and *Sipylus*. It is exceedingly lofty in that part that overlooks Sardis; and is named by the Turks, Booz-dag, or the *Icy* Mountain. A portion of it to the south of the Cilbianian plain is named the Mount of *Mûssa*, or of the Jews. This, therefore, should be the part to which a colony of that nation was sent in the time of Antiochus the Great[1]. These testimonies of the truth of ancient history are very curious, and no less satisfactory; as it encourages the study of it, when it may be so fairly presumed, that other facts, though not proved, existed at least in the belief of the historian.

The *Gygæan* lake, and tomb of Alyattes, are now placed, on the authority of Mr. William Hamilton. He found the former to extend from SE. to NW.

[1] Josephus, Antiq. lib. xii. c. 3. Two thousand Jewish *families* were sent from Mesopotamia and Babylonia, to Lydia and Phrygia; as a check on the rebellious spirit of the natives.

(different from Dr. Chandler), about 6 miles, and 2 in breadth[1]. The tomb itself is particularly described by the Doctor; and proves the general accuracy of Herodotus.

Of SARDIS, it may be said, that there are remains enough of it, to prove its site, and former existence. The name *Sart* is still preserved in a village near the ruins; and a river, which was no doubt the *Pactolus*, descends from Mount *Tmolus*, and passes on the western side of the supposed site, to its junction with the Hermus, about 2 miles to the northward.

The site of Sardis was at the very foot of Mount Tmolus, on one of its projections into the plain, on the north; and where the approximation of this mountain, to those on the north of the Hermus, reduced the plain to the breadth of 7 or 8 miles; whilst it expands on both sides, the plain of Cyrus opening to the east, and the Cilbianian plain to the west; and across the Hermus, obliquely, to the NW. that properly denominated from the Hermus. The citadel stood high up on a shoulder of the mountain; and across the Hermus, directly in front, was the famous lake of Gyges, with the monument of Alyattes, on its high bank[2].

[1] By Mr. Hamilton's observations, it appears that this lake is artificial; being a portion of a hollow valley, shut up in the lower part by a vast mound, on which the monument of Alyattes is raised.

[2] Besides the descriptions of the remains of this ancient city in Chandler, Chishul, and Peyssonel, the reader is referred to the European Magazine for January, 1803, in which is an extract from an interesting Journal of Mode Heidenstam, in 1797.

The position of Magnesia (at Mount Sipylus) was somewhat similar to that of Sardis, being at the very northern foot of that mountain, and with a steep and difficult ascent to the castle.

The second, or middle plain (or bason) of Lydia, is that through which the *Cayster* river flowed, from the southern point of Tmolus to Ephesus. This is very contracted, in comparison with the others, and is even reduced to a kind of strait, between the mountains *Gallesus* and *Pactyas;* but finally opens into a valley of 3 miles wide at the site of Ephesus. The Caystrian plain has more the character of a bason than either of the two others.

Through this plain lay the ancient road from Ephesus to Sardis, across Mount Tmolus, whose base is of great width. This road has been travelled in modern times by very ingenious and observant persons. Beregi was taken for *Hypæpa* by M. D'Anville, but M. de Heidenstam, who passed that way in company with M. Cousineri in 1797, prefers Tappui; as he found there some considerable remains of ancient works, and as it suits the position. Tireh, a considerable town, and the present capital of Aidin, which occurs on the same road, M. de Heidenstam supposes to have been *Mastaura.* M. D'Anville has taken this for *Metropolis;* but erroneously; because it lay in the direct road from Smyrna to Ephesus. Metropolis was no doubt at Tourboli, where M. de Heidenstam and others have found remains, that justify this belief; and in the position that would be expected.

The Asian meadow or plain is supposed to have

been situated between the *Caystrian* and *Mæandrian;* but that space has never yet been examined.

It appears remarkable that M. de Heidenstam, so well informed, should suppose that the plain traversed by the CAYSTER (now called the Lesser Meinder or *Mæander)* should be that intended by the ancients for the *Cilbianian!* Yet such he describes it throughout. But Strabo specifies both, (page 629), and moreover places the Cilbianian Plain at Mount Sipylus.

The third and last plain, or bason, is that of the *Mæander.*

Since the Mæander itself was the common boundary of LYDIA and CARIA, the valley through which the Mæander flows, according to the common course of things, ought to be divided between the two countries. But the Mæander keeps almost entirely *to the Carian side* of the valley; so that the valley may, almost exclusively, be reckoned to Lydia.

The valley of the Mæander, in fact, extends the whole length of its course; not only through Lydia, but Phrygia also; but the present concern is only with what regards Lydia; where it widens into what the ancients denominated the *plain* of the Mæander; and which extends from the borders of Phrygia to the sea, nearly 100 miles. It varies in breadth from 5 to 10 miles; and in ancient times was ornamented and enriched with a number of fine cities and towns. On the Lydian side were those of *Nysa, Tralles, Magnesia,* and *Priene:* and on the Carian, *Miletus,*

Myus, Hieracome, Antiochia. Of these, *Tralles* alone has survived as a town, and is now named Guzel-hissar, or the beautiful castle.

Guzel-hissar, down to the present time, has been taken for Magnesia; but this matter was set right by Mr. W. Hamilton, who first proved the identity of *Nysa,* (by the very pointed description of it in Strabo, page 649) in the ruins a little to the east of Sultan-hissar[1]. And having ascertained this fact, the rest of the positions downwards fall into their places as a matter of course. That is, Guzel-hissar ought to be Tralles; and Magnesia between it and Ephesus. And, accordingly, he found its ruins at a place named Inebuzar, at $12\frac{1}{4}$ G. miles to the ESE. of Ephesus; as nearly the position as possible, by the authority of Strabo, who allows 120 (Roman) stades, or 15 MP.

The northern side of the valley of the Mæander is formed by the ridge of Mount *Messogis,* which extends from Magnesia all the way up, to the site of *Celænæ* and *Apamia Cibotus.* At present, it is named *Kestenous-Dag,* or the *Chesnut Mountains,* between Magnesia and the border of Phrygia; but higher up, *Ak-Dag,* or the White Mountain, from its colour. Below Magnesia, it takes the general name of *Mycale.* More will be said on this subject under the article IÖNIA, on which we have been obliged to encroach in this place.

On the southern side of the valley are the mount-

[1] It is well known that Strabo studied grammar and rhetoric at Nysa.

tains *Grius* and *Titanus*, near the sea; but higher up, we have no knowledge either of the ancient or modern names of the mountains, till we arrive at the portion of Mount *Cadmus*, that closes the scene of our enquiry.

END OF VOL. I.

LONDON:
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Government of Maharashtra
on 06 February, 2016